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Wastewater Characterization and Hazardous Waste Technical Assistance Survey Mather AFB CA

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Final Report

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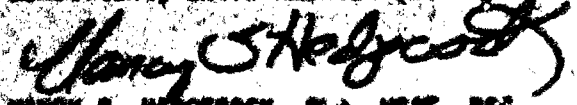

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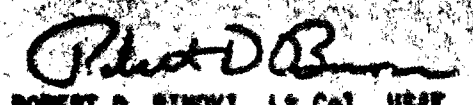

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19. ABSTRACT (Continue on reverse if necessary and identify by block number)

At the request of USAF Hospital Mather/SGPB, personnel from the AFOEHL conducted a wastewater characterization and hazardous waste technical assistance survey at Mather AFB (MAFB) from 28 Nov to 9 Dec 1988. The scope of this survey was to characterize the wastewater, address hazardous waste management practices, and explore opportunities for hazardous waste minimization. The wastewater survey team analyzed the base's industrial effluent, effluent from oil/water separators, and storm water. The hazardous waste survey team performed a shop-by-shop evaluation of chemical waste management practices. They met with hazardous waste managers and engineers to discuss the hazardous waste program. The results of the survey showed that MAFB needs to improve its hazardous waste management program.

Recommendations for improvement include: (1) Collecting two additional grab samples on separate days from the Hospital discharge. Analyze for EPA Method 601 to determine if the grab sample from the survey gives a true indication of what is being discharged.

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Item 19 Cont'd

(2) Locate the source and prevent mercury from the hospital from discharging into the sanitary sewer. (3) Dilute the soaps used for cleaning at the Fuels Lab, building 7060. (4) Investigate the source of chromium from the Photo Lab. (5) Clean out the sewer system manhole directly downgradient from the Photo Lab. (6) Locate the source of contamination in the West Ditch Outfall. (7) Reconnect the two oil/water separators that discharge into the storm sewerage system. (8) Investigate the source of methylene chloride coming on the base. (9) Investigate the source of mercury at Fuel Cell Repair, building 7005. (10) Contact the local sewer district and discuss the possibility of disposing of waste antifreeze in the sanitary sewer system. (11) Analyze for hazardous waste at 323 CAMS Corrosion Control. (12) Provide opportunities for input by the BES and DRMO during the education and training program. (13) Analyze spent Citrikleen to determine if it is hazardous. (14) The wastewater from the waterfall paint booth should be analyzed to determine its hazardous characteristics. (15) Analyze spent chemicals from the dye penetrant and magnetic particle inspection processes to determine which ones are hazardous. (16) Analyze the paper coveralls worn by 323 TRANS Allied Trades personnel during vehicle painting operations to determine if they are hazardous. (17) Maintain a log by satellite accumulation and accumulation site managers to further document activity at the site.

ACKNOWLEDGEMENTS

The authors greatly appreciate the technical expertise and hard work provided by the other members of our survey team, Maj Elliot Ng, Capt David Goldblum, 1Lt Charles Attebery, MSgt Benjamin Hernandez, and SSgt Mary Fields. Without their valuable assistance this survey could never have been accomplished.

We also acknowledge the support given us by the following personnel: Capt Edward Klinenberg, OIC, Bioenvironmental Engineering; the technician staff, Bioenvironmental Engineering Section; and, Mr Paul Seday, the Environmental Coordinator. Thanks for your cooperation.

Contents

ILLUSTRATIONS

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I. INTRODUCTION

Headquarters Air Training Command Bioenvironmental Engineering, HQ ATC/SGPB, requested the AF Occupational and Environmental Health Laboratory, Environmental Quality Division, Environmental Engineering Branch, AFOEHL/EQE, conduct a characterization study of Mather AFB's wastewater and evaluate the base's hazardous waste program. (see Appendix A)

The scope of the wastewater survey was to characterize the effluent from 16 industrial shops, 8 points along the storm sewerage system (including the streams entering and exiting the base), and 13 oil/water separators. The scope of the hazardous waste survey was to address hazardous waste management practices, and explore opportunities for hazardous waste minimization.

The wastewater characterization survey team included 1Lt Charles W. Attebery, 2Lt Shelia P. Scott, MSgt Benjamin Hernandez and SSgt Mary Fields. The hazardous waste survey team included Maj Elliot Ng, Capt David Goldblum and 2Lt Nancy S. Hedgecock. Base points of contact included Capt Edward Klinenberg (OIC, Bioenvironmental Engineering), LTC Blank (Environmental Management Director), and Mr Paul Seday (Environmental Coordinator). The survey was conducted from 28 November to 9 December 1988.

II. DISCUSSION

A. Background

Mather AFB is located in Sacramento County in the foothills of the Sierra Nevada, 12 miles east of the City of Sacramento, California. Mather AFB's primary mission is two fold. First, to qualify non-rated officers as navigators and second to provide navigators with the technical training required to operate the advanced navigation, bombing, missile and electronic warfare systems.

The region surrounding Mather AFB is semiarid and subject to mild yet hot summers with rainy winters and springs. During this survey, the weather was foggy, humid and cold mornings with cool and mild afternoons.

B. Sewerage System

Wastewater discharges from Mather AFB (maintenance, activities and domestic wastewater) flow into Morrison Creek. The base has separate storm and sanitary drainage systems. Industrial effluent was found being discharged into both the storm and sanitary sewer systems.

The storm sewer system includes emergency oil/water separators in line in the West and South ditches. Morrison Creek is used for industrial and agricultural water supply, recreation, aesthetic enjoyment, groundwater recharge, and preservation and enhancement of fish, wildlife and other aquatic resources.

C. Discharge Limitations

County of Sacramento Sewer Use Regulations govern the discharge from Mather AFB. A six-month source control point permit is required for the Plating and Cleaning Shop discharge. This permit controls the discharge of

cadmium, chromium, lead, nickel, zinc and cyanide to the sanitary sewer system. The base has a verbal agreement with the County that the base will not discharge any chemicals into the storm sewer system.

1. Summarized in Table 1 are the general discharge limitations pertaining to Mather AFB. Their basis is Section 6.6 of the industrial sewer user permit and the pretreatment standards in the Code of Federal Regulations, Title 40, Part 403, (40 CFR 403). A

Table 1. Industrial Discharge Limitations

PARAMETER	30-DAY	DAILY MAX
Oils and Greases	____	300 mg/l
Petroleum Hydrocarbons	____	100 mg/l
Phenols	0.1 mg/l	0.2 mg/l
Surfactants (MBAS)	0.5 mg/l	1.0 mg/l

2. The pH of the discharge must be greater than 6.0 and less than 10.

3. The maximum daily dry weather discharge may not be greater than 1.4 million gallons.

4. Toxic metals limitations for the base from pretreatment standards, 40 CFR 433, are summarized in Table 2.[3]

Table 2. Toxic Metals Limitations

METAL	LIMIT	
	MAX (mg/l)	AVG (mg/l)
Cyanide, Total	1.20	0.65
Copper	3.38	2.07
Nickel	3.98	2.38
Chromium	2.77	1.71
Zinc	2.61	1.48
Lead	0.69	0.43
Cadmium	0.11	0.07
Total Toxic Organics	2.13	
Silver	0.43	0.24

5. The discharge cannot exceed the following limitations:

a. Biochemical oxygen demand (BOD) of 3,000 pounds per day (1257 mg/l, based on a maximum flow of 1.4 MGD); or

b. Suspended solids of 3,000 pounds per day (1257 mg/l); or

c. Chemical oxygen demand (COD) of 5,000 pounds per day, (2095 mg/l).

6. Any radioactive wastes.

7. The following receiving water limitations prohibit the discharge from causing:

a. The dissolved oxygen concentration in Morrison Creek to fall below 5.0 mg/l.

b. Visible oil, grease, scum, or foam in the receiving waters or watercourses.

c. Concentrations of any materials in the receiving waters which are deleterious to human, animal, aquatic, or plant life.

d. Esthetically undesirable discoloration of the receiving waters.

e. Fungus, slimes, or other objectionable growths in the receiving waters.

f. Bottom deposits in the receiving waters.

g. Increased turbidity of the receiving waters by more than 20% over background levels.

h. Alteration of the normal ambient pH of the receiving water more than 0.5 units.

i. Increased normal ambient temperature of the receiving water more than 5°F (3°C).

j. A violation of any applicable water quality standard for receiving waters adopted by the State Water Resources Control Board.

III. PROCEDURES

A. Wastewater Characterization Survey

1. Flow. Continuous instantaneous flow measurements were taken from the parshall flume located at the abandoned sewage treatment plant on Mather AFB. This flow represented the total amount of flow exiting the base. The base's daily average flow for seven days, 29 November-4 December 1988, was 0.9 MGD.

2. Sampling

a. Sampling Strategy. Mather AFB has a sewer use permit and also regulatory limits on the Plating and Cleaning Shop. Therefore, the sampling parameters were based on these permits. Sampling sites were identified through the efforts of personnel from base Bioenvironmental Engineering Services, the Environmental Management Directorate and AFOEHL/EQE.

b. Sampling Site Numbers and Locations. Table 3 gives the location and type of wastewater sampling sites. Figures 1, 2, and 3 give the approximate locations of the sampling sites. Figure 4 illustrates typical sampling sites. Figure 5 shows one of the two points where influent enters the base. A typical oil/water separator is shown in Figure 6.

c. Sampling Frequency. Samples from 25 sites were 1-day 24-hour equiproportional samples composited hourly. Samples from Sites 16 and 19 were 2-day 24-hour equiproproportional samples composited hourly from 12 oil/water separators. The team took grab samples. Composite samples and grab samples were collected with Isco Model 2100 and 2700 Automatic Wastewater Composite Samplers.

Table 3. Sample Site Location and Type

SITE	LOCATION	TYPE
1	Bldg 4150 Plating and Cleaning	Sanitary
2	Bldg 4260 Aero Repair/Tire	Sanitary
3	Bldg 3474 Entomology	Sanitary
4	Bldg 7052 Special Purpose Maintenance	Sanitary
5	Bldg 650 Hospital	Sanitary
6	Bldg 7060 Fuels Lab	Sanitary
7	Bldg 2890 Photo Lab	Sanitary
8	Bldg 2950 Machines/Metals	Sanitary
9	Bldg 7033 Non-Powered AGE	Sanitary
10	Bldg 4850 Army Support Facilities	Sanitary
11	Bldg 7045 Egress	Sanitary
12	Bldg 7005 Fuel Cell Repair	Sanitary
13	Bldg 7010 Flight Line Maintenance	Sanitary
14	Bldg 7035 Corrosion Control	Sanitary
15	Bldg 18011 Weapons Storage Area	Sanitary
16	Near Bldg 4012 West Ditch Outfall	Storm
17	Near Bldg 7037 West Ditch Outfall	Storm
18	Near Bldg 7300 South Ditch Outfall	Storm
19	Bldg 4995 Influent to Mather AFB	Storm
20	Near Mather Lake Influent to Mather AFB	Storm
21	West Ditch Emergency Oil/Water Separator	O/W Separator
22	South Ditch Emergency Oil/Water Separator	O/W Separator
23	Housing Outfall Meet South Ditch	Storm
24	Near Bldg 8160 940 Alert Area	Sanitary

OIL/WATER SEPARATORS

SITE	LOCATION	SERVING	TYPE
25	7038 & 7034	7035 and 7010	O/W Separator
26	7019	7022	O/W Separator
27	4251	CAMS Washrack	O/W Separator
28	4771	ARMY Washrack	O/W Separator
29	2989 OR 2991	CE Tractor	O/W Separator
30	7051	Transportation	O/W Separator
31	3320	3320	O/W Separator
32	7009	7009	O/W Separator
33	7024	7024	O/W Separator
34	7300	7300	O/W Separator
35	Parshall flume influent to old sewage treatment plant		Sanitary
36	Influent onto Mather AFB near water treatment plant		Storm
37	7020	320 Avionics Maintenance Squadron	Sanitary

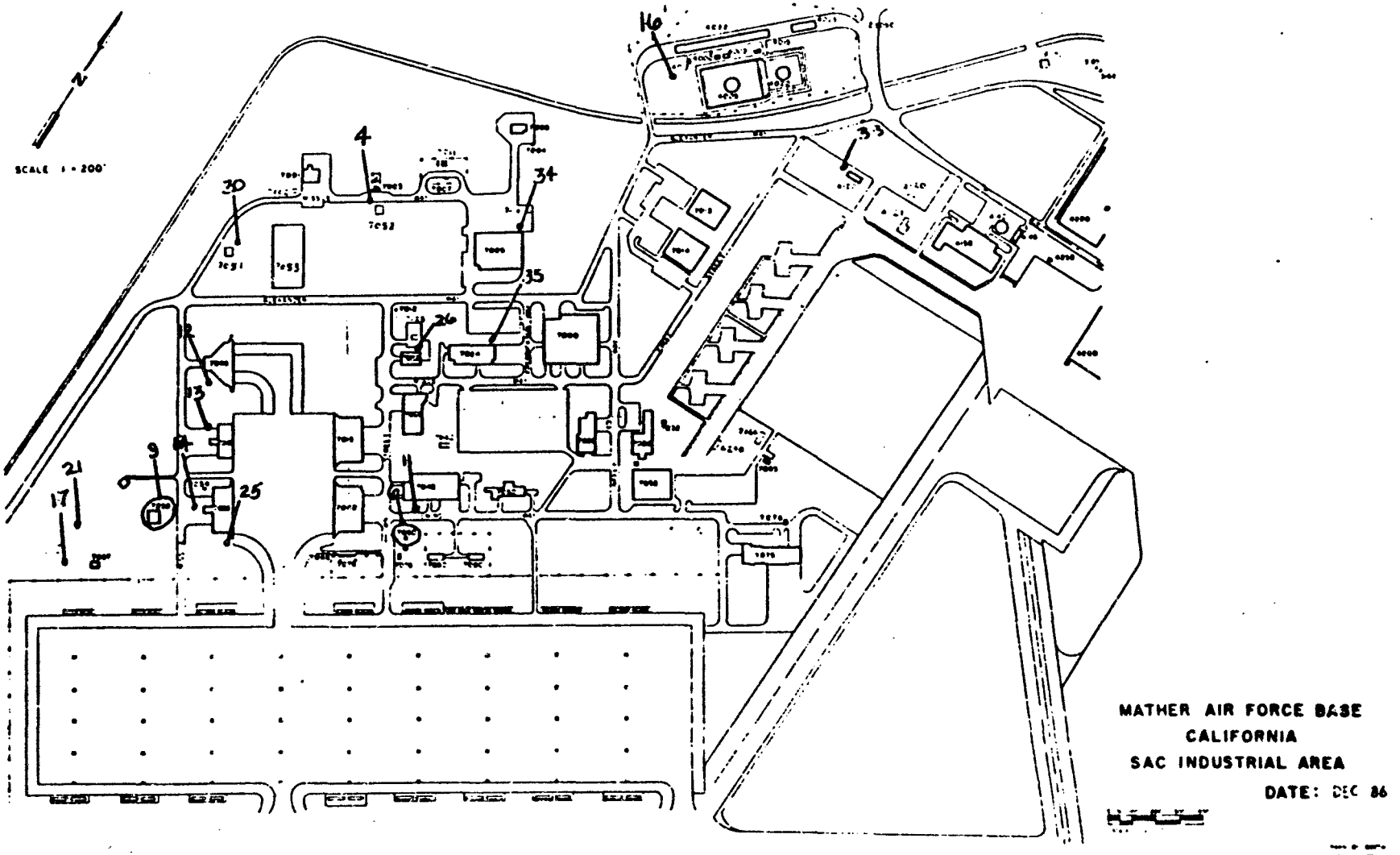

Figure 1. Site Locations

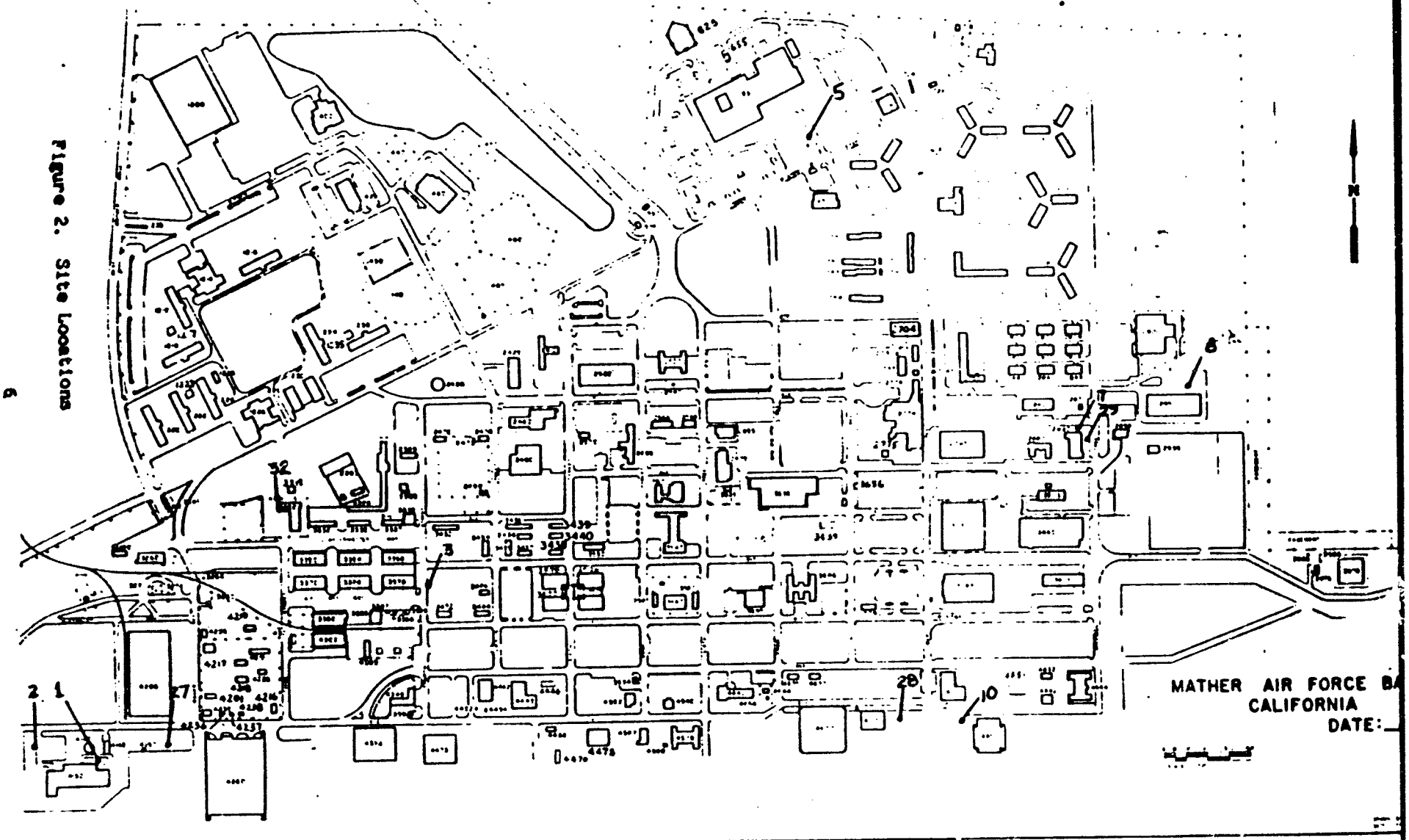

Figure 2. Site Locations

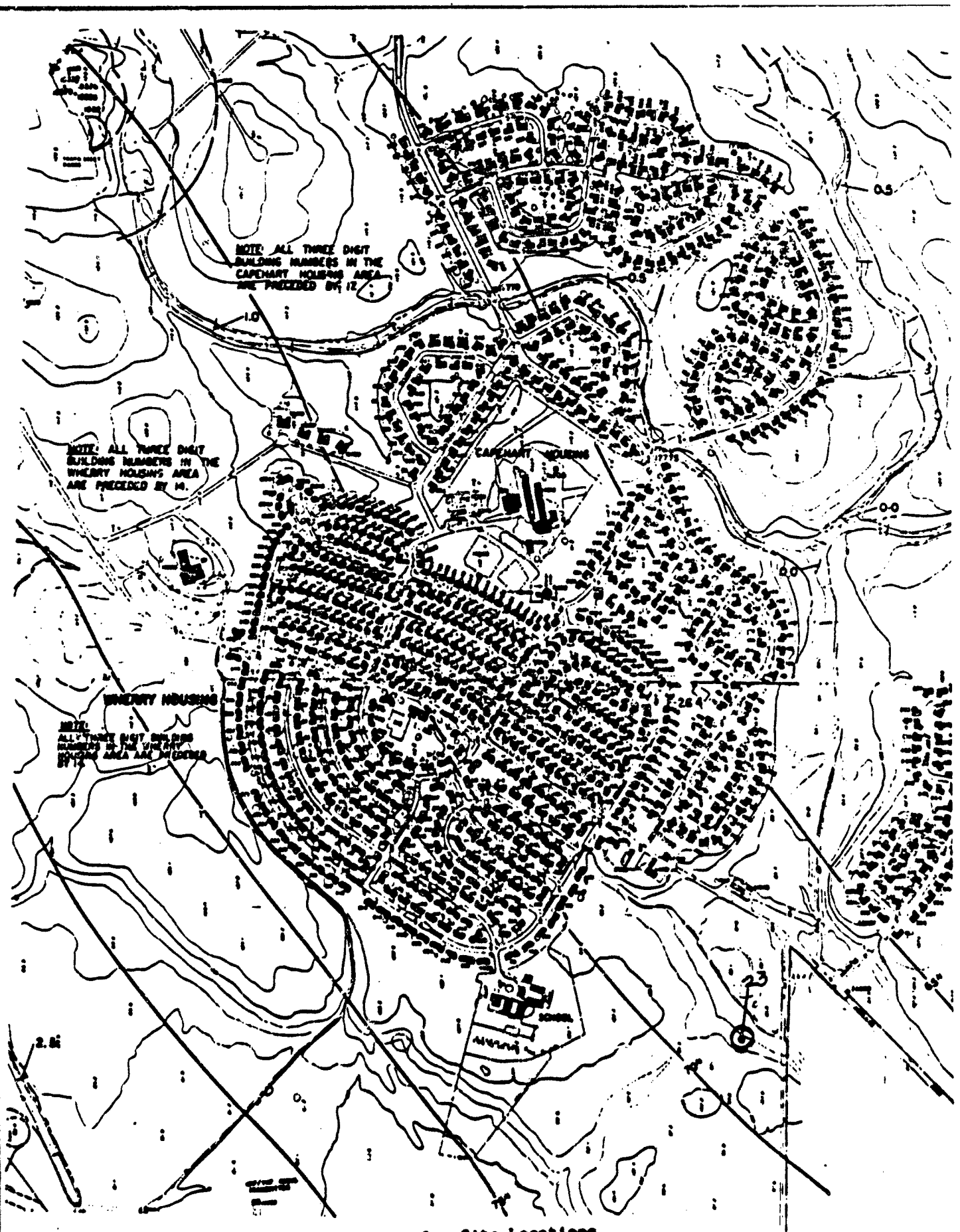

Figure 3. Site Locations

Figure 4. Outfall From the South Ditch

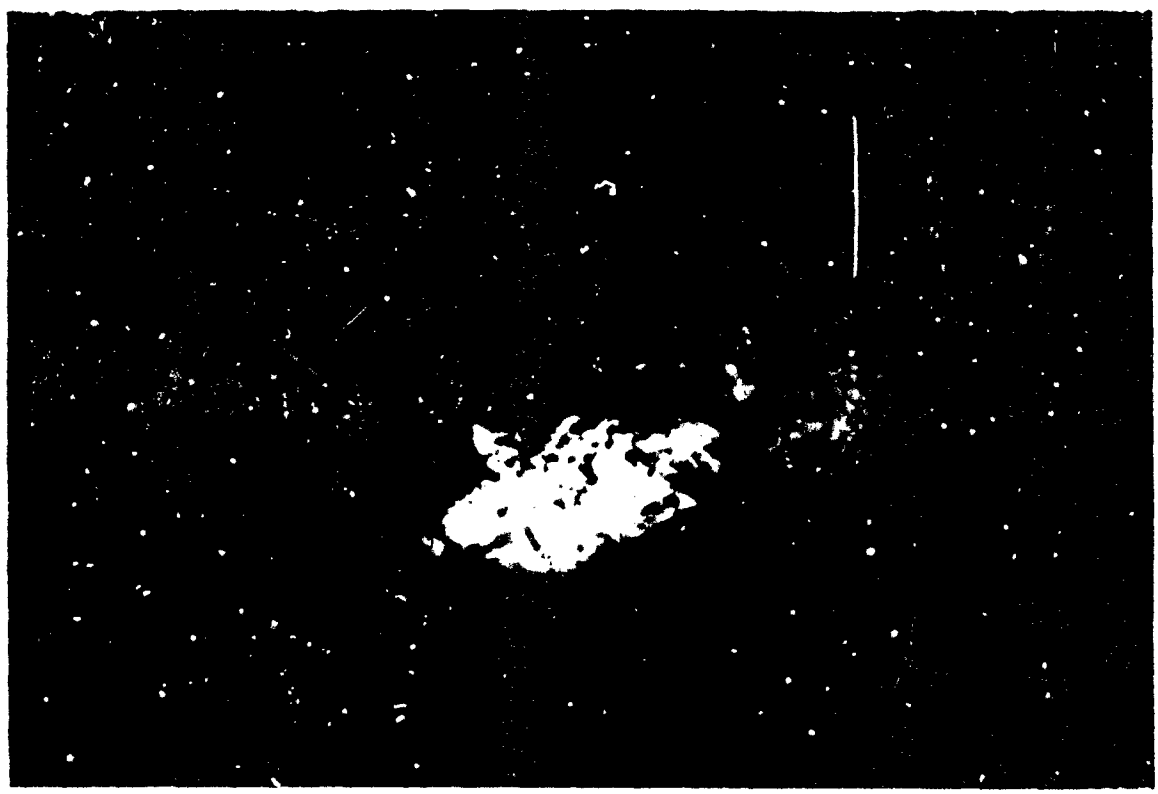

Figure 5. Mather AFB Influent

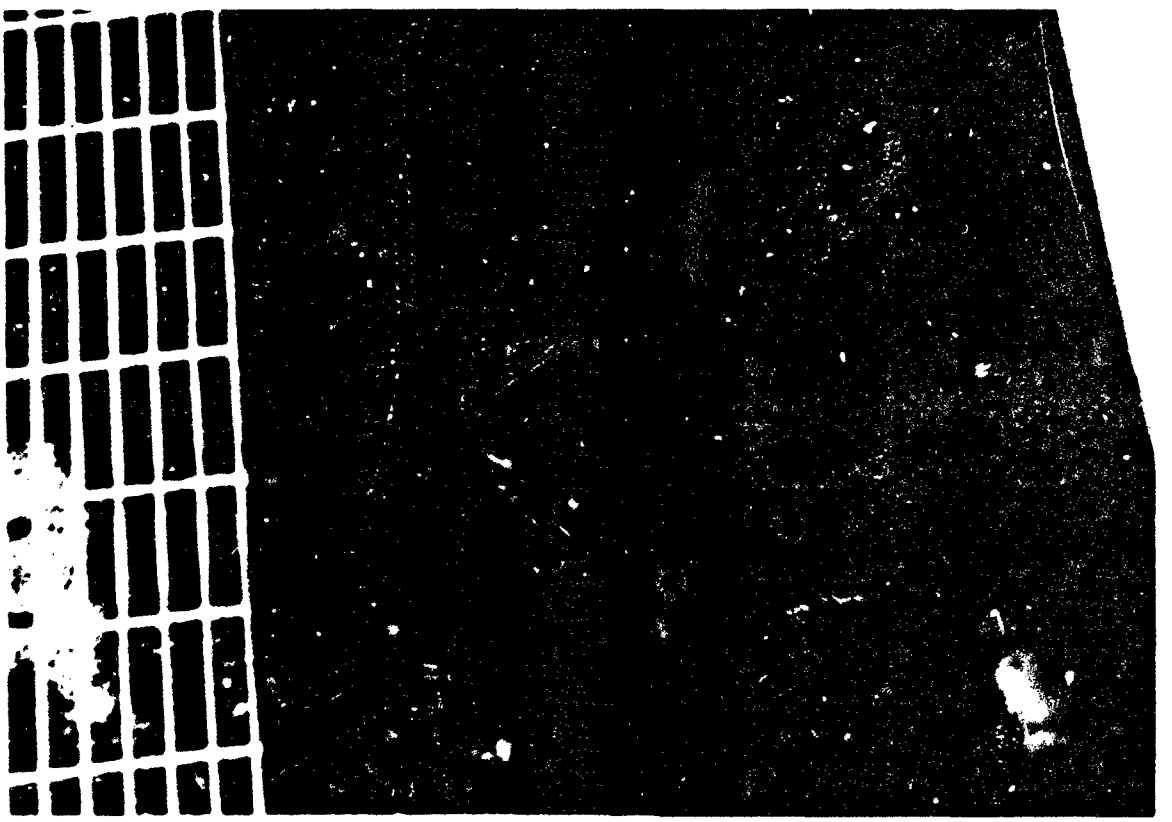

Figure 6. South Ditch Emergency O/W Separator

d. Sampling Analyses. Table 4 shows the method of analysis and the preservation method for each parameter. Table 5 includes a summary of sampling sites with corresponding analyses.

Table 4. ANALYSES AND PRESERVATION METHODS FOR SITES

Analysis	Preservation	Method	Where	Who
pH	none	A423	on-site	AFOEHL
Temperature	none	E170.1	on-site	AFOEHL
COD	none	A410.4	Brooks AFB	AFOEHL
BOD-5	none	A405.1	on-site	AFOEHL
Oils and Greases, Total Recoverable	H_2SO_4	E413.1	Brooks AFB	AFOEHL
Cyanide	NaOH	A412D	Brooks AFB	AFOEHL
ICP Metals Screen As, Cd, Ba, Ca, Cr, Co, Fe, Mg, Mn, Ni, Zn, Al, Mo, Be, Cu, V	HNO_3	E200.7	Brooks AFB	AFOEHL
Mercury	HNO_3	E245.1	Brooks AFB	AFOEHL
MBAS (Methylene Blue Active Substances)	none	E425.1	Brooks AFB	AFOEHL
Petroleum Hydrocarbons, Total Recoverable	HCl	E418.1	Brooks AFB	AFOEHL
Volatile Halocarbons	HCl	E601	Brooks AFB	AFOEHL
Volatile Aromatics	HCl	E602	Brooks AFB	AFOEHL
Phenols	none	E604	Contract lab	DataChem
Boron	none	A404A	Brooks AFB	AFOEHL
Organochlorine Pesticides and PCB	none	E608	Brooks AFB	AFOEHL
Characteristic Hazardous Waste (Ignitability, Corrosivity, Reactivity)	none	E625	Brooks AFB	AFOEHL
Specific Conductance	none	E120.1	Brooks AFB	AFOEHL
Total Supended Solids	4°C	A209F	Brooks AFB	AFOEHL

Notes: A - indicates Standard Methods for the Evaluation of Water and Wastewater
E - indicates EPA Methods for Chemical Analysis of Water and Wastes

Table 5. Site Analysis

PARAMETER	SITE 1	2	3	4	5	6	7	8	9	10
pH	X	X	X	X	X	X	X	X	X	X
Temperature	X	X	X	X	X	X	X	X	X	X
Chemical Oxygen Demand	X	X	X	X	X	X	X	X	X	X
Biochemical Oxygen Demand					X					
Oils and Greases	X	X	X	X	X	X	X	X	X	X
Cyanide		X			X		X			
ICP Metals Screen		X	X	X	X		X	X	X	X
Mercury		X	X		X				X	X
Boron	X	X			X		X			
MBAS (Methylene Blue Active Substances)	X	X	X	X	X	X	X	X	X	X
Total Suspended Solids	X	X	X	X	X	X	X	X	X	X
Organochlorine Pesticides			X							
Phenols	X	X	X		X	X				
Volatile Halocarbons	X	X		X	X	X				
Volatile Aromatics	X	X		X	X	X				
Hazardous Waste									X	X
Petroleum Hydrocarbons	X	X	X			X			X	X
Conductivity	X	X	X	X	X	X	X	X	X	X

PARAMETER	SITE 11	12	13	14	15	16	17	18	19	20
pH	X	X	X	X	X	X	X	X	X	X
Temperature	X	X	X	X	X	X	X	X	X	X
Chemical Oxygen Demand	X	X	X	X	X	X	X	X	X	X
Biochemical Oxygen Demand							X	X		
Oils and Greases	X	X	X	X	X	X	X	X	X	X
Cyanide			X			X	X	X	X	X
ICP Metals Screen	X	X		X	X	X	X	X	X	X
Mercury	X	X		X	X	X	X	X	X	X
Boron			X			X	X	X	X	X
MBAS (Methylene Blue Active Substances)	X		X	X	X	X	X	X	X	X
Total Suspended Solids	X		X	X	X	X	X	X	X	X
Organochlorine Pesticides										
Phenols	X				X	X	X	X	X	X
Volatile Halocarbons	X				X	X	X	X	X	X
Volatile Aromatics	X				X	X	X	X	X	X
Hazardous Waste				X	X					
Petroleum Hydrocarbons										
Conductivity	X	X	X	X	X	X	X	X	X	X

PARAMETER / SITE	21	22	23	24	25	26	27	28	29	30
pH	X	X	X	X	X	X	X	X	X	X
Temperature	X	X	X	X	X	X	X	X	X	X
Chemical Oxygen Demand	X	X	X	X	X	X	X	X	X	X
Biochemical Oxygen Demand										
Oils and Greases	X	X	X	X	X		X			X
Cyanide		X								
ICP Metals Screen		X			X	X	X			
Mercury		X								
Boron		X								
MBAS (Methylene Blue Active Substances)	X	X	X	X	X	X	X	X	X	X
Total Suspended Solids	X	X	X	X	X	X	X	X	X	X
Organochlorine Pesticides										
Phenols	X	X	X	X	X	X	X	X	X	X
Volatile Halocarbons		X								
Volatile Aromatics		X								
Hazardous Waste	X		X	X		X		X	X	X
Petroleum Hydrocarbons	X		X	X	X		X			X
Conductivity	X	X	X	X	X	X	X	X	X	X

PARAMETER / SITE	31	32	33	34	35	36	37
pH	X	X	X	X	X	X	X
Temperature	X	X	X	X	X	X	X
Chemical Oxygen Demand	X	X	X	X	X	X	X
Biochemical Oxygen Demand							
Oils and Greases	X	X	X	X	X		X
Cyanide							
ICP Metals Screen		X				X	X
Mercury							
Boron							
MBAS (Methylene Blue Active Substances)	X	X	X	X	X		
Total Suspended Solids	X	X	X	X	X		
Organochlorine Pesticides							
Phenols	X	X	X		X		
Volatile Halocarbons							
Volatile Aromatics							
Hazardous Waste	X	X	X	X	X		
Petroleum Hydrocarbons							
Conductivity	X	X	X	X	X	X	X

B. Hazardous Waste Survey

The first step of the survey was to review the base's hazardous waste management plan and the Bioenvironmental Engineer's industrial shop folders to determine which shops generate chemical wastes. This was followed by visits to 29 shops to observe industrial operations, discuss chemical waste disposal practices with shop personnel, and hand out chemical disposal survey forms (see Appendix C). These forms, which were completed by shop personnel, were reviewed by the survey team and provided additional information for subsequent

discussions with shop personnel. Also, the Hazardous Waste Storage Facility (HWSF), and each hazardous waste accumulation site (10 total) were visited and evaluated. The following individuals were contacted to discuss their responsibility and involvement in the hazardous waste program:

LTC Blank, Environmental Management Director, DEEV, AV 674-3324
Capt Klinenberg, Chief, Bioenvironmental Engineering, SGPB, AV 674-2284
MSgt Sparks, NCOIC, Bioenvironmental Engineering, SGPB, AV 674-2284
Mr Seday, Environmental Coordinator, DEEV, AV 674-3324

Based on the data from the completed chemical disposal survey forms, the annual forecasted quantities for nine categories of waste were determined (see Table 6). From Table 6, Column 3 the majority of the waste, 56.21%, consists of waste oils and fluids; however, these wastes are not considered hazardous wastes. Nineteen percent of the total amount of waste generated is drummed and disposed of as hazardous waste through Defense Reutilization and Marketing Office (DRMO). Itemized listings of wastes (including categories, shop, amount of waste, and disposal method) are found in Appendix D. Appendix E lists those wastes disposed of as hazardous waste.

Table 6. Annual Forecasted Quantities for Waste Categories at Mather AFB

PRODUCT	TOTAL (GAL/YR)	%TOTAL	DISPOSED AS HAZ WASTE (GAL/YR)	%TOTAL HAZ WASTE
Oils & Fluids	10363	56.21	0	0
Paints & Thinners	298	1.62	298	8.45
Fuels	1339	7.26	0	0
Strippers	437	2.37	437	12.39
PD-680	800	4.34	680	19.28
Antifreeze	1212	6.57	1212	34.36
Soaps	2436	13.21	0	0
Photo and NDI	1011	5.48	900	25.52
Safety Kleen	540	2.93	0	0
TOTAL:	18436		TOTAL: 3527	

IV. DISCUSSION

A. Wastewater Characterization Survey

1. Introduction

a. Contaminant concentrations as well as physical and chemical parameters are presented in the following section to characterize the industrial wastestreams and oil/water separators. Some high concentrations show a potential problem with waste disposal practices. Other concentrations are typical of normal domestic wastewater being disposed through the sanitary and storm sewerage system. The following is a description of sites with significant results. Appendix B gives complete analytical results for each site.

b. Grab samples obtained were analyzed for volatile organic compounds (VOCs, EPA Methods 601 and 602) and total suspended solids (TSS). Composite samples were analyzed for chemical oxygen demand (COD), toxic metals (TMs), conductivity (SC), methylene blue active substances (MBAS), oil and grease (O&G), and pesticides as required by the nature of the waste source.

2. Sanitary Sewer System

a. Site 1. A 24-hour sample composited hourly and a 1-day grab sample were taken from the Plating and Cleaning Shop, bldg 4150. TSS, 128 mg/l; COD, less than 10 mg/l; and TM were within limits. Chloroform (0.3 \g/l), methylene chloride (0.2 \g/l), and 1,1,1-trichloroethane (1.1 \g/l) were detected. This is the only site regulated by the county.

b. Site 3. A 24-hour composite sample was taken from the manhole servicing the Entomology Shop, bldg 3474. The COD was 250 mg/l, TSS was 576 mg/l, and SC was 1055 µmhos. Concentrations of lead (259 µg/l), mercury (12 µg/l), and zinc (1024 µg/l) approached or exceeded limits of 430 µg/l, 5 µg/l, and 1480 µg/l, respectively. High concentrations of lead, mercury and zinc could be the result of painting and stripping. No pesticides were detected.

c. Site 4. A 24-hour composite sample was collected from the manhole servicing Special Purpose Maintenance, bldg 7052. The COD was 1000 mg/l, and the TSS was 94 mg/l.

d. Site 5. A 24-hour composite sample and a 1-day grab sample were collected from the manhole servicing the Hospital, bldg 650. The COD was 500 mg/l and TSS was 980 mg/l. The mercury level (10 µg/l) was higher than normally seen (5 µg/l) in wastewater. Except for an unusually high amount of methylene chloride (26,000 µg/l or 26 ppm), other volatile organic and aromatic compounds were not detected.

e. Site 6. A 24-hour composite sample was taken from a manhole servicing the Fuels Lab, bldg 7060. The COD was 170 mg/l and TSS was 4 mg/l. MBAS level (150 mg/l) exceeded the daily maximum (1 mg/l). Due to considerable equipment washing, high concentrations of soaps were being discharged into the sanitary sewer.

f. Site 7. A 24-hour composite sample was collected from the manhole servicing the Photo Lab, bldg 2890. The COD was 725 mg/l, TSS was 108 mg/l, and SC was 3840 µmhos. The MBAS level (6.8 mg/l) exceeded the daily maximum (1 mg/l). The chromium concentration level (8806 µg/l) exceeded the maximum limit (2770 µg/l).

g. Site 8. A 24-hour composite sample was collected from the manhole servicing the Machines/Metals Shop, bldg 2950. The COD was 220 mg/l and TSS was 39 mg/l. All analyses for metals were within limits.

h. Site 9. A 24-hour sample composited hourly was taken from the manhole servicing Non-Powered AGE, bldg 7033. The COD was 325 mg/l and O&G were 11.5 mg/l. TSS was 38 mg/l, and SC was 951 µmhos. The MBAS level (3.0 mg/l) exceeded the daily maximum (1 mg/l). Copper level was 569 µg/l. Copper levels along with MBAS concentrations could be from leaching of copper pipes and also through washing.

i. Site 10. A 24-hour sample composited hourly was collected from the manhole servicing Army Support Facilities, bldg 4850. The COD was 950 mg/l. O&G levels were 64 mg/l. TSS was 810 mg/l, and SC was 3349 µmhos. TMs were within limits. The high TSS level indicates the presence of inorganic dissolved solids.

j. Site 11. A 24-hour composite sample was taken from the manhole servicing Egress, bldg 7045. Wastewater was essentially free of contaminants. The COD was less than 10 mg/l, and TSS was 3 mg/l. TM analyses were within limits.

k. Site 12. A 24-hour composite sample was collected from the manhole servicing Fuel Cell Repair, bldg 7005. The COD was 130 mg/l, and TSS was 44 mg/l. The mercury (4.2 µg/l) was approaching a significant level of 5 µg/l.

l. Site 13. A 24-hour composite sample was taken from the manhole servicing Flight Line Maintenance, bldg 7010. The COD was 265 mg/l, TSS was 80 mg/l and SC was 1264 µmhos. TM concentrations were within limits.

m. Site 14. A 24-hour sample composited hourly was collected from a manhole servicing Corrosion Control, bldg 7035. The COD was 620 mg/l, TSS was 2008 mg/l and SC was 2061 µmhos. The MBAS level was at the daily maximum (1 mg/l). TM were within limits. The high TSS is attributable to the presence of organic particles.

n. Site 15. A 24-hour sample composited hourly was collected from the manhole servicing the Weapon Storage Area, bldg 18011. Concentration of COD was 240 mg/l. O&G was 32.8 mg/l, and total extractable petroleum hydrocarbons was 27 mg/l, TSS was 194 mg/l, and SC was 1167 µmhos. TM were within limits. The total phenol concentration was 28 µg/l.

o. Site 24. A 24-hour composite sample was collected from the manhole servicing the 940th Alert Area near building 8160. The COD was 60 mg/l, and TSS was 4 mg/l. TM were within limits. The phenol concentration was 7.5 µg/l.

p. Site 37. A 24-hour composite sample was taken from the manhole servicing 320 Avionics Maintenance Squadron, bldg 7020. The COD concentration was 130 mg/l and TSS was 44 mg/l. The concentration of O&G was 6.3 mg/l. Metals were within limits.

3. Storm Sewer System

a. Site 16. A 2-day, 24-hour, composite sample along with two 1-day grab samples were taken from the West Ditch Outfall near building 4012. First day: COD was 285 mg/l; TSS was 22 mg/l; copper level was 251 µg/l; volatile organics and aromatics were not detected. Second day: COD was less than 10 mg/l; TSS was 138 mg/l; metals results were within limits. Volatile organics and aromatics found were chloroform (4.6 µg/l), trichloroethylene (0.2 µg/l) and methylene chloride (15 µg/l).

b. Site 17. A 24-hour composite sample was collected from the West Ditch Outfall near building 7037. The COD was 425 mg/l, and TSS was 182 mg/l. MBAS (2200 mg/l) exceeded the daily maximum level (1 mg/l). Cadmium (399 µg/l), lead (140 µg/l) and zinc (795 µg/l) approached or exceeded the average or maximum limits of 110 µg/l, 430 µg/l and 1480 µg/l, respectively.

c. Site 18. A 24-hour composite sample was collected from the South Ditch Outfall near building 7300. The COD was 50 mg/l and TSS was 115 mg/l. TM levels were within limits.

d. Site 19. A 2-day, 24-hour sample composited hourly and two 1-day grab samples were taken from the influent to Mather AFB near building 4995. First day: COD was 15 mg/l; TSS was 39 mg/l; cyanide level was 0.01 mg/l; VOCs were not detected. Second day: COD was 20 mg/l; TSS was 84 mg/l; cyanide concentration was 0.11 mg/l. The TMS for both days were within limits. VOCs found were chloroethane (0.8 µg/l) and methylene chloride (0.9 µg/l).

e. Site 20. A 24-hour composite sample and 1-day grab sample were collected from the influent to Mather Lake. COD was less than 10 mg/l and TSS was 3 mg/l. TMS were within limits. Methylene chloride (32 µg/l) was detected.

f. Site 23. A 24-hour composite sample was taken from the Housing outfall. The COD was 20 mg/l and TSS was 692 mg/l. TM were within limits.

g. Site 35. A 24-hour sample was collected from the downstream area of a parshall flume in the abandoned sewage treatment plant. All wastes from the sanitary sewer system pass through this flume. COD was 105 mg/l; O&G were 22.1 mg/l; petroleum hydrocarbons were 18 mg/l. TSS was 160 mg/l. MBAS level (4.8 mg/l) exceeded the daily maximum (1 mg/l). TM were within limits. Phenol was 12 µg/l.

h. Site 36. A 24-hour composite sample was collected from the influent to Mather AFB near the Water Treatment Plant. COD was 15 mg/l and TSS was 71 mg/l. TM were within limits.

4. Oil Water Separators

a. Site 2. A 24-hour composite sample and 1-day grab sample were taken from the water phase of the oil/water separator of the Aero Repair/Tire Shop, building 4260. TSS was 654 mg/l, the MBAS was 18 mg/l, COD was 355

mg/l, and O&G were 40 mg/l. The zinc concentration (2335 µg/l) exceeded the daily limit (1480 µg/l) and approached the maximum limit (2610 µg/l). VOCs results indicated methylene chloride (35 µg/l), benzene (53 µg/l), ethylbenzene (54 µg/l) and toluene (225 µg/l).

b. Site 21. A 24-hour composite sample was taken from the West Ditch emergency oil/water separator. COD was 20 mg/l, TSS was 1 mg/l. TM were within limits.

c. Site 22. A 24-hour composite sample was taken from the South Ditch emergency oil/water separator. COD was 25 mg/l, TSS was 2 mg/l. TM were within limits.

d. Site 25. A grab sample was collected from the oil/water separator servicing Corrosion Control Shop, building 7035 and Flight Line Maintenance Shop, building 7010. The oil/water separator discharges to the storm drainage system. COD was 610 mg/l, TSS was 8 mg/l and SC was 1484 mg/l. MBAS (270 mg/l) exceeded the limit (1 mg/l). Cadmium (186 µg/l), copper (432 µg/l), lead (103 µg/l), and zinc (558 µg/l) approached or exceeded limits of 110 µg/l, 2070 µg/l, 430 µg/l, and 1480 µg/l, respectively.

e. Site 26. A grab sample was collected from the oil/water separator servicing Aerospace Ground Equipment, building 7022. The COD was 580 mg/l. TSS was 27 mg/l. MBAS level (6 mg/l) exceeded the limit (1 mg/l). Lead (184 µg/l) and zinc (1260 µg/l) levels approached limits of 430 µg/l and 1480 µg/l, respectively.

f. Site 27. A grab sample was taken from the oil/water separator servicing CAMS washrack near building 4251. COD was 185 mg/l, and TSS was 46 mg/l. MBAS level (26 mg/l) exceeded the limit (1 mg/l). Metals analyses were within limits.

g. Site 28. A grab sample was taken from an oil/water separator servicing the Army washrack near building 4771. COD was 800 mg/l, and TSS was 200 mg/l. Lead (466 µg/l) and zinc (700 µg/l) levels approached or exceeded reasonable limits of 430 µg/l and 1480 µg/l, respectively.

h. Site 29. A grab sample from the Civil Engineering Tractor Facility near building 2989 had a COD of 100 mg/l, TSS was 260 mg/l. MBAS was 14 mg/l. Metals were within limits.

i. Site 30. A grab sample was taken from the oil/water separator servicing the Motor Pool, building 7051. COD was 560 mg/l, O&G were 52.8 mg/l and petroleum hydrocarbons were 48 mg/l. TSS was 92 mg/l and MBAS was 25 mg/l. Lead levels (270 µg/l) exceeded limits (100 µg/l). Methylene chloride was 0.3 µg/l.

j. Site 31. A grab sample was taken from the oil/water separator servicing the Auto Hobby Shop, building 3320. COD was 15 mg/l and TSS was 42 mg/l. Lead and zinc concentrations were 48 µg/l and 264 µg/l, respectively.

k. Site 32. A grab sample was collected from the oil/water separator servicing Equipment Maintenance, bldg 7009. COD was 2200 mg/l, O&G were 168 mg/l with petroleum hydrocarbons of 159 mg/l. TSS was 200 mg/l. MBAS was 4700 mg/l. Cadmium level (217 µg/l) exceeded the limit (110 µg/l). High levels of MBAS indicate extensive equipment washing.

l. Site 33. A grab sample was taken from the oil/water separator servicing the Propulsion Shop, bldg 7024. The oil/water separator discharges to the storm drainage system. COD was 4100 mg/l, O&G were 90.4 mg/l with petroleum hydrocarbons of 89 mg/l. TSS was 176 mg/l. MBAS was 2300 mg/l. High levels of cadmium (3276 µg/l), lead (1066 µg/l) and zinc (2536 µg/l) exceeded limits of 110 µg/l, 430 µg/l, and 1480 µg/l, respectively. Copper level was 104 µg/l.

m. Site 34. A grab sample was taken from the Fire Training Pit, building 7300, oil/water separator. This oil/water separator discharges to the storm drainage system. COD was 4800 mg/l. O&G were 488 mg/l with 484 mg/l of petroleum hydrocarbons. TSS was 76 mg/l with 2278 umhos. MBAS level (8 mg/l) exceeded the limit (1 mg/l). Zinc level (2040 µg/l) exceeded the limit (1480 µg/l).

B. Hazardous Waste Program

The hazardous waste program at Mather AFB is working fairly well. The Environmental and Contract Planning Office in Civil Engineering, 323 CES/DEEV, is responsible for the management of the entire program. DRMO is responsible for contractual waste removal. Bioenvironmental Engineering Services (BES) helps monitor the program through industrial shop surveys and is responsible for waste sampling. Water Treatment Plant personnel are responsible for operating the Hazardous Waste Storage Facility (HWSF).

Individual shops are responsible for identifying, segregating, handling, packaging, and labeling the wastes generated by their shop. The wastes are usually placed in 55-gallon drums located either at a satellite accumulation site or a designated accumulation site. The accumulation site manager is contacted whenever wastes need to be transferred from a satellite accumulation site to a designated accumulation site.

DEEV is contacted when wastes need to be transferred from an accumulation site to the HWSF. The accumulation site monitor completes an AF Form 2005 and takes it to Mr Seday (the Environmental Coordinator). Mr Seday signs it (indicating that funds are available for disposal of the waste) and takes the form to Supply. Supply generates a DD Form 1348-1 using the information contained on the AF Form 2005. Once this process is completed, an appointment is made with Water Treatment Plant personnel who unlock the HWSF so the wastes can be transferred to the facility. DRMO is then contacted to arrange for contractual waste removal. Waste oil is sold for 8 cents per gallon and waste fuel is sold for 11 cents per gallon. All other wastes are disposed at a cost to the base.

Any unknown wastes are analyzed before disposal. The BES has the responsibility to sample unknown wastes and other waste streams on an as needed basis. Samples are sent to the AF Occupational and Environmental Health Laboratory, Analytical Services Division (AFOEHL/SA) for analysis. Results are sent back to BES who notifies DEEV of the results.

V. DESCRIPTION OF INDUSTRIAL ACTIVITIES

Twenty-nine industrial shops (Master List contained in Appendix F) were surveyed and their chemical waste handling practices were documented. The findings for each industrial shop follow (see Appendix G for a shop-by-shop listing of waste disposal practices).

A. 323 Transportation Squadron (TRANS)

1. Shop: General Purpose Maintenance — Bldg: 7052
   Contact: Mr Koch — AUTOVON: 674-3470

Shop personnel are responsible for performing all maintenance on vehicles such as vans, pickups, and automobiles. The shop generates waste brake fluid (1 gallon/month), transmission fluid (10 gallons/month), and motor oil (70 gallons/month). These wastes are accumulated in 55-gallon drums, stored at the shop's accumulation site, and turned in for disposal through DRMO. The shop has two 30-gallon Safety Kleen units that are serviced every two months by the Safety Kleen Corporation. Dirty rags are exchanged on a one-for-one basis through linen exchange. Used Speedy Dry and oil filters are accumulated in the same 55-gallon drum and disposed through DRMO. Batteries are exchanged on a one-for-one basis through CoPars. The shop has a caustic soda hot tank that is used for engine cleaning. The tank is not changed out but skimmed and replenished every two months by a contractor. Spent antifreeze (30 gallons/month) is accumulated in a 55-gallon drum and disposed of through DRMO. Aircraft soap (2 gallons/month) is used for floor cleaning. The shop floor drains lead to an oil/water separator connected to the sanitary sewer.

2. Shop: Special Purpose Maintenance — Bldg: 7052
   Contact: Mr Koch — AUTOVON: 674-2709

Shop personnel perform maintenance on all large and heavy vehicles and equipment. The shop generates waste brake fluid (1 gallon/ month), transmission fluid (10 gallons/month), hydraulic fluid (1 gallon/ month), and motor oil (80 gallons/month). These wastes are accumulated in 55-gallon drums, stored at the TRANS accumulation site, and turned in for disposal through DRMO. Spent antifreeze (30 gallons/month) is accumulated in a 55-gallon drum and disposed through DRMO. Used Speedy Dry, oil filters, and fuel filters are accumulated in the same 55-gallon drum and disposed through DRMO. Batteries are exchanged on a one-for-one basis through CoPars. The shop has one 30-gallon Safety Kleen unit that is serviced every two months. Dirty rags are exchanged on a one-for-one basis through linen exchange. Aircraft soap (1 gallon/month) is used for floor cleaning.

3. Shop: Allied Trades — Bldg: 7052
Contact: Mr Koch — AUTOVON: 674-3470

Shop personnel are responsible for painting and performing body work on all base vehicles. The shop generates waste lacquer, polyurethane and enamel paints and thinners (5 gallons/month). The paint wastes are accumulated in a 10-gallon can that is stored in the shop. When full, the can is emptied into a 55-gallon drum and stored at the TRANS accumulation site. The waste is disposed of as hazardous waste through DRMO. Empty aerosol cans are accumulated in a 30-gallon drum and disposed as hazardous waste through DRMO. The shop has a waterfall paint booth (800-gallon capacity) that is cleaned every two weeks. The wastewater is discharged down the drain to an oil/water separator connected to the sanitary sewer. The sludge is drummed along with other paint wastes. Paper coveralls worn by personnel during painting operations are drummed and disposed as hazardous waste through DRMO.

4. Shop: Refueling Maintenance — Bldg: 7051
Contact: Mr Koch — AUTOVON: 674-4686

Shop personnel are responsible for maintaining aircraft refueling trucks. Waste JP-4 (45 gallons/year) is generated during maintenance operations. The waste is accumulated in a 55-gallon drum and disposed as hazardous waste through DRMO. Empty aerosol cans are taken to Allied Trades and put in a waste aerosol can drum. Spent antifreeze is drummed with antifreeze generated at General Purpose Maintenance. Dirty rags are exchanged on a one-for-one basis through linen exchange. Shop floor drains lead to an oil/water separator connected to the sanitary sewer.

5. Shop: Fire Truck Maintenance — Bldg: 7075
Contact: SSgt Justice — AUTOVON: 674-2175

This shop is responsible for maintaining all Mather AFB's fire fighting vehicles. The shop generates waste oil and fluid (5-10 gallons/month). The wastes are drummed in a 55-gallon drum. When full, the drum is transported to the TRANS accumulation point

B. 323 Consolidated Aircraft Maintenance (CAMS)

1. Shop: Plating and Cleaning — Bldg: 4150
Contact: Mr Dittrich — AUTOVON: 674-2770

Shop personnel are responible for plating and cleaning aircraft parts and aircraft ground support equipment. The shop is divided into three sections: Cleaning, Abrasive Blasting, and Electroplating. The Cleaning Section contains tanks 1-18 and the Electroplating Section contains tanks 19-36 (see Table 7 for tank contents, capacity, and change out frequency). The sandblasting room contains one walk-in blasting room and two single station blasters. Rice hulls, walnut shells, garnet sand, and glass beads are used for blast media. The wastes (800 gallons/year) are collected in a hopper, drummed, and disposed as hazardous waste through DRMO. The rinse waters from plating and cleaning processes are discharged down the drain to the sanitary sewer. The remaining plating and cleaning wastes are drummed and disposed of as hazardous waste through DRMO.

Table 7. 323 CAMS Plating and Cleaning Tanks

Tank	Contents	Capacity (gal)	Change Out Frequency
1	CEE-BEE J-84	168	1/yr
2	Hot Rinse Water	120	Continual
3	Cold Rinse Water	120	Continual
4	Alkaline Builder (NSN 6850-00-935-0995)	120	1/yr
5	Citrikleen	336	1/yr
6	(deleted)		
7	PD-680	70	1/yr
8	PD-680	70	1/yr
9	Cold Water Rinse	490	Continual
10	Paint Remover (CEE-BEE R28A)	800	1/18 months
11	Process 6A (MIL-D-26549)	418	1/2 yrs
12	Citrikleen	219	2/yr
13	Paint Remover (MIL-R-83936)	329	1/yr
14	Paint Remover (MIL-R-83936A)	329	1/yr
15	Cleaning Compound (MIL-C-25169H)	329	Replenished Only
16A	Water Wash	329	Continual
16B	Hot Water Rinse	329	Continual
17	Paint Remover (CEE-BEE R-28)	772	1/18 months
18	CEE BEE Stainless Steel Pickle	200	1/18 months
19	Vapor Degreaser (MIL-T-875388)	30	1/yr
20	Caustic Soda	235	2/yr
21	Cold Rinse Water	235	Continual
22	Cadmium Plating Sol'n	269	1/4-10 yrs
23	Cold Water Rinse	269	Continual
24	Hot Water Rinse	269	Continual
25	23% Nitric Acid	67	1/yr
26	Hydrochloric Acid	40	1/2 yrs
27A	(deleted)		
27B	Iridite 5-3	40	1/2 yrs
28	Hot Rinse Water	269	Continual
29	Nickle Plating Sol'n	40	1/4-10 yrs
30	Bronze Plating Sol'n	40	1/4-10 yrs
31	Cadmium Plating Sol'n	40	1/4-10 yrs
32	(deleted)		
33	Chromicoat	40	1/2 yrs
34	Dow 19	30	1/2 yrs
35	Water Rinse	30	Continual
36	Quenching Oil	40	unknown

2. Shop: Corrosion Control — Bldg: 4150
Contact: TSgt Hill — AUTOVON: 674-3598

Shop personnel are responsible for corrosion control and painting small aircraft parts and aircraft ground support equipment. Shop personnel are also responsible for maintaining the aircraft washrack. The shop generates waste dope and lacquer thinner, polyurethane paint and thinner, and acetone (190 gallons/year total). The wastes are accumulated inside the shop in a 5-gallon can; when full, the can is taken outside and emptied into a 55-gallon drum. The wastes are disposed as hazardous waste through DRMO. Isopropyl alcohol, denatured alcohol, and Naphtha are used for wipe on/wipe off parts cleaning. The shop has two paint booths which were recently converted from waterfall paint booths to dry filter paint booths. The paint filters are currently being drummed and will be disposed according to forthcoming analytical results. The paint booth conversion and the use of electrostatic paint spray equipment has reduced the amount of paint wastes generated from 220 gallons/year to 190 gallons/year. Dirty rags are exchanged on a one-for-one basis through linen exchange.

Approximately two T-37 aircraft and one T-43 aircraft are washed a week at the washrack. CALLA 505 soap (40-60 gallons/month) and PD-680 (5 gallons/month) are used for aircraft washing. The washrack drains lead into an oil/water separator (Site 27) which is connected to the sanitary sewer.

3. Shop: Pneudraulics/Fuel Cell Repair — Bldg: 4260
Contact: TSgt Grant — AUTOVON: 674-2765

Pneudraulics/Fuel Cell Repair shop personnel are responsible for troubleshooting, repairing, and testing hydraulic components and repairing integral fuel systems on T-37 and T-43 aircraft. The shop has two 30-gallon PD-680 tanks that have never been changed out. Waste hydraulic fluid (40 gallons/month) is drummed and disposed through DRMO. Any fuel that is removed from the fuel tanks is put in a bowser for reuse.

4. Shop: NDI — Bldg: 4260
Contact: Mr Davidson — AUTOVON: 674-2247

Shop personnel are responsible for performing inspection of T-37 and T-43 aircraft structural components using dye penetrant, magnetic particle and x-ray inspection methods. Spent developer (100 gallons/year) is discharged down the drain to the sanitary sewer. Spent fixer (100 gallons/year) is processed through a silver recovery unit whose effluent is discharged down the drain to the sanitary sewer.

Dye penetrant inspection is an open system which uses penetrant, emulsifier, and developer. At the time of the survey, a lipophilic inspection process was used; however, the shop planned to convert to a hydrophilic inspection process in 1989. This conversion should reduce the amount of hazardous wastes generated by the shop. Parts are sequentially dipped in the penetrant and the emulsifier then rinsed and allowed to dry. Next, the part is dipped in the developer, passed through a drying oven, inspected, and rinsed. Spent penetrant (200 gallons/year), emulsifier (200 gallons/year),

and developer (400 gallons/year) are drummed and disposed of as hazardous waste through DRMO. Rinse water generated during the inspection process is discharged down the drain to the sanitary sewer. Magnetic particle solution (100 gallons/year) is drummed and disposed of as hazardous waste through DRMO.

5. Shop: Phase Docks — Bldg: 4260
Contact: MSgt Aguon — AUTOVON: 674-4966

Phase Dock personnel are responsible for performing isochronal aircraft inspections. The shop generates hydraulic fluid (40 gallons/year) and lubricating oil (10 gallons/year). The wastes are drummed and disposed through DRMO.

6. Shop: AGE — Bldg: 4348
Contact: Mr Jackson — AUTOVON: 674-2792

AGE shop personnel are responsible for performing periodic inspections, and for maintaining, refueling, and dispatching flight line support equipment. Waste hydraulic fluid (2 gallons/month) is accumulated in a 55-gallon drum and disposed through DRMO. Waste motor oil (25 gallons/month) and synthetic oil (1 gallon/month) are placed in a bowser and disposed through DRMO. Waste PD-680 (45 gallons/6 months) is drummed and disposed as hazardous waste through DRMO. Waste MoGas (10 gallons/month), diesel (15 gallons/month), and JP-4 (2 gallons/month) are placed in 55-gallon drums and disposed through DRMO. Waste antifreeze (1 gallon/month) is placed in a 55-gallon drum and disposed as hazardous waste through DRMO. Citrikleen is diluted at a 4:1 ratio for use on the washrack. At the time of the survey, the washrack was not operational. Used Speedy Dry is drummed and disposed through DRMO. Dirty rags are exchanged on a one-for-one basis through linen exchange.

7. Shop: Propulsion — Bldg: 4376
Contact: TSgt Hofstadter — AUTOVON: 674-2511

This shop is responsible for the teardown, inspection, repair, and reassembly of J69-25A engines during scheduled maintenance. Personnel are also responsible for performing unscheduled maintenance as necessary. The shop generates waste synthetic oil (55 gallons/quarter). The waste is placed in a 55-gallon drum and disposed through DRMO. The shop has a 20-gallon PD 680 tank that is changed out every 180 days. Its contents are drummed and disposed as hazardous waste through DRMO. Dirty cleaning rags are exchanged on a one-for-one basis through linen exchange.

8. Shop: Aero Repair/Tire — Bldg: 4260
Contact: Mr Harris — AUTOVON: 674-2533

Shop personnel are responsible for disassembling, cleaning, and assembling aircraft wheels and tires. The shop has one Citrikleen tank (5 gallons) that is changed out every 60 days. The waste is placed in a waste oil drum that is shared by other shops in the building.

C. 323 Civil Engineering Squadron (CES)

1. Shop: Liquid Fuels Maintenance — Bldg: 3386
Contact: TSgt Track — AUTOVON: 674-2229

Shop personnel are responsible for repairing and maintaining all fuel systems on base. Fuel sludge (800 gallons/5 years) is generated during fuel tank cleaning operations. The sludge is accumulated in a bowser and transported to an aboveground storage tank at the HWSF. The waste is then disposed through DRMO.

2. Shop: Exterior Electric — Bldg: 3354
Contact: Sgt Mercer — AUTOVON: 674-3483

Shop personnel are responsible for maintaining all exterior electric transformers on base. According to shop personnel, all PCB transformers have been removed from base. No hazardous waste is generated at this shop.

3. Shop: Entomology — Bldg: 3474
Contact: Mr Burns — AUTOVON: 674-3527

Shop personnel are responsible for pest management and weed control throughout the base. Empty containers are triple-rinsed, certified nonhazardous, rendered unusable, and disposed in a landfill. Water from the triple-rinsing procedure is reused for mixing herbicides and pesticides.

D. 320 Field Maintenance Squadron (FMS)

1. Shop: AGE — Bldg: 7022
Contact: SSgt Torres — AUTOVON: 674-4829

Shop personnel are responsible for performing periodic inspections, for major and minor maintenance and for refueling and dispatching aircraft flight line support equipment. The shop generates waste motor oil (50 gallons/month), synthetic oil (10 gallons/month), and antifreeze (15 gallons/month). The wastes are drummed separately in 55-gallon drums and disposed through DRMO. Waste brake fluid (1 gallon/year), transmission fluid (1 gallon/month), and hydraulic fluid (10 gallons/month) are placed in the same 55-gallon drum and disposed through DRMO. Spent Citrikleen (20 gallons/month) is placed in a 55-gallon drum and disposed through DRMO. Waste JP-4 and MoGas (100 gallons/year total) are drummed and disposed through DRMO. Dirty cleaning rags are exchanged on a one-for-one basis through linen exchange. Aircraft cleaning soap (20 gallons/month) is diluted at a 1:1 ratio and used for washing equipment. The washrack appeared to be connected to the storm sewer rather than the sanitary sewer.

2. Shop: Propulsion — Bldg: 7024
Contact: SSgt McFarland — AUTOVON: 674-2323

Shop personnel are responsible for repairing and rebuilding defective engines, cleaning parts and bearings, and testing repaired engines

for the B-52 aircraft. The bearing room generates 7808 oil (30 gallons/4 months), carbon remover (20 gallons/4 months), fingerprint remover (4 gallons/4 months), and PD-680. The 15-gallon PD-680 tank has a filter system that eliminates the need to dispose of the PD-680. However, the filter system cannot be used because the tank does not have an air quality permit. The main shop area has two Citrikleen tanks (80-gallon and 15-gallon). The waste Citrikleen is drummed and disposed of as hazardous waste through DRMO, but has not been analyzed to verify whether it is hazardous or nonhazardous. The shop has a fuel manifold tester. The calibrating fluid (12 gallons/4 months) and the 7808 oil (350 gallons/year) are drummed and disposed of through DRMO.

3. Shop: Corrosion Control — Bldg: 7035
   Contact: Sgt Orona — AUTOVON: 674-2867

Shop personnel are responsible for touch-up painting on B-52 aircraft and flight line support equipment. Shop personnel are also responsible for washing the aircraft and the flight line support equipment. The shop has a 500-gallon waterfall paint booth which is cleaned out twice a month. The sludge (4 gallons/month) is drummed and disposed as hazardous waste through DRMO. The wastewater is discharged down the drain through an oil/waste separator to the sanitary sewer (Site 14). Alkaline soap (120 gallons/month) is used for washing the aircraft. The wash water is discharged down the drain to the same oil/water separator.

4. Shop: Phase Docks — Bldg: 7015
   Contact: TSgt Folkerts — AUTOVON: 674-2242

Shop personnel are responsible for performing periodic aircraft inspections and maintenance. Small quantities of 7808 oil, 5606 hydraulic fluid, and JP-4 are drained into large pans filled with Speedy Dry. The saturated Speedy Dry (100 gallons/month) is drummed and disposed of through DRMO. Asbestos (6 double bags/aircraft) is disposed of through DRMO. The shop has a PD-680 tank. It is not used, and therefore it is not changed out regularly.

5. Shop: Pneudraulics — Bldg: 7045
   Contact: TSgt Lueddecke — AUTOVON: 674-4767

Shop personnel are responsible for maintaining aircraft hydraulic components. Waste hydraulic fluid (150 gallons/year) generated from the test stand is drummed and disposed of through DRMO. PD-680 (90 gallons/year) is used for parts cleaning. The waste is drummed and disposed as hazardous waste through DRMO.

6. Shop: Repair and Reclamation — Bldg: 7045
   Contact: SSgt Thompson — AUTOVON: 674-4952

Shop personnel are responsible for breaking down, cleaning, repairing, and reassembling wheel assemblies. The shop has one PD-680 tank that generates approximately 175 gallons of waste PD-680 per year. The waste is drummed and disposed of as hazardous waste through DRMO.

7. Shop: Jet Engine Test Cell — Bldg: 7099
Contact: TSgt Porter — AUTOVON: 674-2674

Shop personnel are responsible for testing and performing minor maintenance on B-52 aircraft engines. JP-4 (10 gallons/month), hydraulic fluid (3 gallons/month), and 7808 oil (2 gallons/month) leak from the engines into drains leading into an oil/water separator connected to the sanitary sewer. Any oils or fluids that are collected are taken to the Propulsion Shop and placed in a drum.

8. Shop: Fuel Cell Repair — Bldg: 7005
Contact: MSgt Head — AUTOVON: 674-3512

Shop personnel are responsible for repairing aircraft fuel systems. All fuel tanks are turned in empty so this shop does not generate any hazardous waste.

E. 320 Organizational Maintenance Squadron (OMS)

1. Shop: Non-powered AGE — Bldg: 7033
Contact: Mr Tully — AUTOVON: 674-4185

Shop personnel are responsible for the inspection, maintenance, and repair of non-powered aerospace support equipment. The shop has a three compartment bowser for mixed waste, hydraulic fluid, and engine oil (see Figure 7). Each compartment holds 150 gallons and is locked. The contents of the mixed waste compartment is logged. Every six months the bowser is taken to the HWSF and emptied into the appropriate bulk aboveground storage tank. The shop also has two 425-gallon JP-4 bowsers (see Figure 8). The uncontaminated fuel is taken to POL for reprocessing.

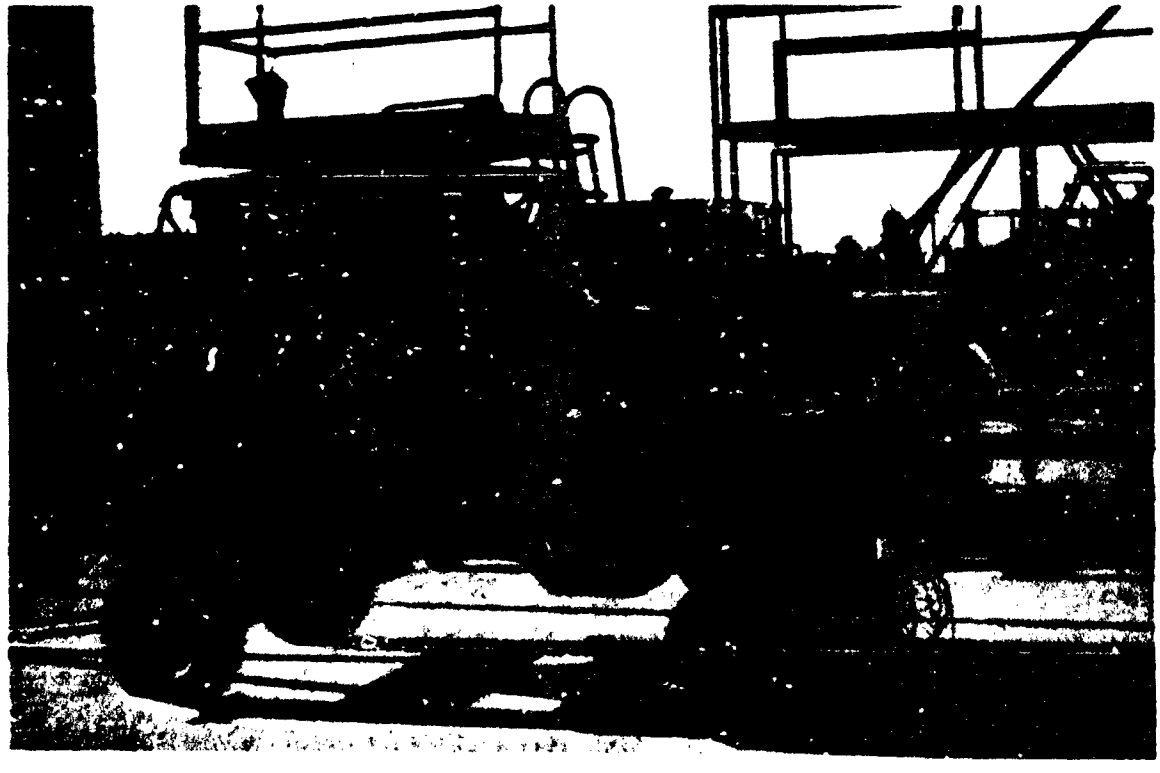

Figure 7. OMS Waste Oils and Fluids Bowser

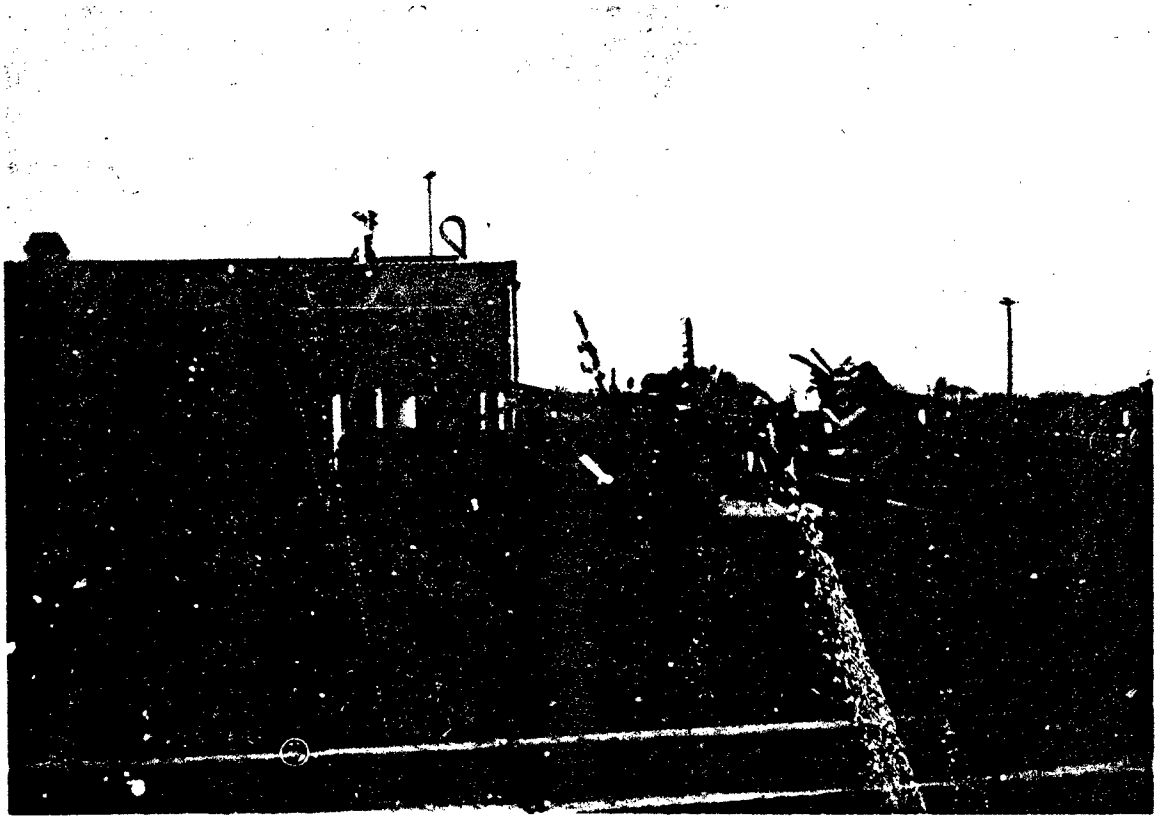

Figure 8: OMS Reclaimed JP-4 Bowser

F. USAF Hospital (HOSP)

1. Shop: Medical Laboratory — Bldg: 650
   Contact: MSgt Waller — AUTOVON: 674-4697

Laboratory personnel are responsible for performing clinical analysis for the hospital. All chemical reagents are mixed with water and flushed down the drain. Microbiological and immunization wastes are autoclaved and placed in red biohazard boxes or bags. Sharps are placed in rigid, red plastic boxes before being placed in red biohazard bags. All other contaminated wastes are placed in red biohazard bags or boxes. All biohazard waste is disposed of through a medical waste contractor.

2. Shop: Pharmacy — Bldg: 650
   Contact: Maj Merchant — AUTOVON: 674-3388

Pharmacy personnel are responsible for dispensing prescription and non-prescription drugs to patients. Waste generated during chemotherapeutic procedures are disposed of through a medical waste contractor. Expired drugs are either flushed down the drain to the sanitary sewer or incinerated.

G. Training Services Division (323 FTW)

Shop: Photo Laboratory — Bldg: 2890
Contact: Mr Elder — AUTOVON: 674-3515

Shop personnel are responsible for processing color and black and white film. Fixer is processed through a silver recovery unit and then discharged down the drain to the sanitary sewer. All other photo processing chemicals are discharged down the drain to the sanitary sewer.

H. 323 Air Base Group (ABG)

Shop: Auto Hobby Shop — Bldg: 3536
Contact: Mr Anderson — AUTOVON: 674-3320

The Auto Hobby Shop provides a wide range of facilities for customers to use while servicing their private automobiles. Waste oil (220 gallons/month), waste transmission fluid (20 gallons/month) and brake fluid (1 gallon/month) are drained from the vehicles into pans which are later emptied into 55-gallon drums. When full, the drums are transported to the HWSF. Used Speedy Dry and oil filters are drummed together and disposed of as hazardous waste through DRMO. The shop has a 30-gallon PD-680 tank that is changed out every six weeks. The waste PD-680 is drummed and disposed as hazardous waste through DRMO. The shop has two empty underground storage tanks that are not used. Waste antifreeze (25 gallons/month) is drummed and disposed of through DRMO. Dirty rags are exchanged on a one-for-one basis through linen exchange.

VI. SUMMARY OF GENERAL WASTE DISPOSAL PRACTICES AT MATHER AFB

The general waste disposal practices for different categories of waste are summarized in this section. A detailed summary of disposal practices for each waste category is contained in Appendix D.

1. Empty pesticide and herbicide containers generated at the Entomology Shop are triple-rinsed, rendered non-usable, and disposed as nonhazardous waste in a municipal landfill. The rinsewater is put back into the appropriate tank and later used for mixing pesticides and herbicides.

2. Waste oils and fluids are placed in 55-gallon drums located at satellite accumulation sites or accumulation sites. From there they are transported to the HWSF, and placed in the aboveground bulk waste oil storage tank. Finally the wastes are sold to a contractor for 8 cents per gallon. In some cases, waste oil is discharged to oil/water separators which are periodically pumped out by contractors.

3. Uncontaminated waste fuels are sent to POL for reuse. Contaminated fuel is placed in the aboveground bulk waste fuel storage tank and sold to a contractor for 11 cents per gallon.

4. Soaps and cleaning compounds are rinsed down the drain, in some cases through oil/water separators.

5. Spent antifreeze is placed in 55-gallon drums and disposed of as hazardous waste through DRMO.

6. Safety Kleen Corporation personnel visit the shops to service the Safety Kleen degreasing units as needed. They drain the used degreasant and refill the units on a prescribed schedule. This eliminates the base's need to purchase and dispose of the degreasant, (normally PD-680).

7. Saturated Speedy Dry, used oil filters, and used fuel filters are drummed together and disposed of as hazardous waste through DRMO.

8. 323 Transportation Squadron drums and disposes of empty aerosol spray cans as hazardous waste.

9. Dirty rags are exchanged on a one-for-one basis through linen exchange. The rags are then sent to a local contractor for cleaning.

10. Waste fixers are sent through a silver recovery unit. The effluent is discharged to the sewer system. Other photo wastes are diluted and discharged into the sewer system.

11. A large amount of PD-680 is used for degreasing operations (approximately 680 gallons/year). Waste PD-680 from most shops is placed in 55-gallon drums and stored at designated accumulation sites before being transferred to the HWSF.

12. Most non PD-680 solvents are disposed of in 55-gallon drums as a hazardous waste. Some solvents are used in process or rinsed down the drain to the sanitary sewer via an oil/water separator.

13. Waste paints and thinners are placed in 55-gallon drums, stored at a designated accumulation site and then transported to the HWSF. Finally, they are disposed of as hazardous waste through DRMO.

14. Lead-acid batteries used in vehicles maintained by transportation are exchanged through a local contractor (CoPars). Other batteries used throughout the base are disposed wet through DRMO.

VII. OBSERVATIONS AND CONCLUSIONS

A. Wastewater Characterization Survey

1. The County of Sacramento sewer use regulations and the 6-month point source permit for Plating and Cleaning Shop on Mather AFB are the only regulatory requirements for the base. Mather AFB has a verbal agreement with the county that the base will not discharge any chemicals to the storm sewer system.

2. The industrial effluent discharges to the Sacramento Wastewater Treatment Plant, a 150-MGD oxygen activated sludge plant. The plant has a bar screen, 12 primary sedimentation tanks, primary and secondary clarifiers which use pure oxygen rather than air. The wastewater is then dechlorinated before discharged into the Sacramento River. The sludge from the grit chamber and the bar screen are put in a high rate heat anaerobic digester for approximately 20 days. The remaining sludge is placed in a sludge lagoon. After five years, the lagoon is dredged and the sludge put in a landfill monitored by 20 to 24 groundwater monitoring wells. Volatile organic compounds are removed by a biological remover tower or activated carbon.

3. A sample from the hospital showed a concentration of 26 parts per million of methylene chloride in the sanitary sewer. Reference 40 CFR 261.3 IV(b), Definition of a Hazardous Waste, methylene chloride is considered a hazardous waste if the maximum total weekly usage of these solvents divided by the average weekly flow of wastewater into the headworks of the treatment plant does not exceed 25 parts per million.

4. The effluent from the Entomology Shop contained several of the priority pollutants in high concentrations. These pollutants are not usually found in high concentrations in normal Entomology processes. The lead, mercury and zinc are metals normally found in paints. Heavy painting can cause these results.

5. The discharge from the Hospital contained a high level of mercury, possibly from the dental clinic evacuation system.

6. The Fuels Lab, building 7060, discharged an excessive amount of surfactants (150 mg/l) into the sanitary sewer.

7. A sample of the effluent from the Photo Lab contained a high concentration of chromium (8.8 mg/l). The chromium could be a constituent of a photographic chemical such as chromium intensifier (NSN 6750-00-174-5473).

8. The Fuel Cell Repair discharge, building 7005, contained a high level (4.2 µg/l) of mercury. One possible explanation could be a broken manometer.

9. The West Ditch Outfall discharge, near building 4012, contained copper, chloroform, trichloroethylene and methylene chloride. These contaminants should not be in the West Ditch Outfall discharge.

10. The West Ditch Outfall discharge, near building 7037, contained high surfactants along with toxic metals of cadmium, lead and zinc. This indicates that discharge from industrial shops are going to the storm sewerage system. The high MBAS indicates that a large quantity of soap, most likely from a washrack, is discharged directly into the storm drain. None of these contaminants should be in the West Ditch Outfall. Industrial operations responsible for these contaminants should be moved so that wastes can be contained or pretreated and discharged to the sanitary sewer.

11. The stream entering Mather AFB near building 4995 contained cyanide, boron, chloroethane and methylene chloride. Methylene chloride by definition is a hazardous waste due to its toxicity.

12. One of the influents (Site 20) to Mather AFB which flows into Mather Lake contained methylene chloride.

13. The discharge from the Aero Repair/Tire Shop's oil/water separator, building 4260, contained methylene chloride, benzene, ethylbenzene and toluene.

14 The discharge from the oil/water separator serving the Corrosion Control Shop (building 7035) and Flight Line Maintenance Shop (building 7010) contained concentrations of surfactants (1 mg/l) and high concentration of chromium (432 ug/l). These contaminant levels were caused by aircraft parts cleaning.

15. The CAMS washrack oil/water separator contained a high concentration of surfactants. This is normal for a washrack separator.

16. The oil/water separator discharge from Equipment Maintenance (building 7009) had a high COD. This can be attributed to the high level of surfactants (4700 mg/l). Also, the discharge contained a high concentration of cadmium (217 ug/l).

17. The oil/water separator discharge from the Propulsion Shop, building 7024, contained a large amount of surfactants and heavy metals (cadmium, lead, zinc and copper). The overflow goes into the storm sewage system.

18. The Fire Training Pit's (building 7300) oil/water separator discharge overflows into the storm sewage system. The flow had a high concentration of COD, O&G (primarily petroleum hydrocarbons) and zinc. This possibly indicates that other than fire fighting contaminants are discharged into the storm sewerage system.

B. Hazardous Waste Survey

1. Currently, the spent chemicals generated by 323 CAMS Plating and Cleaning are being disposed as hazardous waste through DRMO. Analysis are being performed on the chemicals to determine which ones are actually hazardous. This effort will probably reduce the amount of hazardous waste generated at the shop.

2. The hazardous waste program is operating very well. Each shop generating hazardous waste has a primary and an alternate hazardous waste monitor. All hazardous waste monitors are trained in hazardous waste management by DEEV and are responsible for training other personnel in the shops. Shop personnel are generally very knowledgeable and supportive of the program.

3. Hazardous waste management pratices are consistent throughout the base. Most hazardous waste storage drums are locked and a log of the drum contents is maintained by the shop's hazardous waste monitor (see Figure 9).

Figure 9: Looked Waste Storage Drum

4. Mather AFB has submitted a waste analysis plan to the California Department of Public Health for review.

5. The accumulation sites are in excellent condition. Most of the sites are metal structures located on concrete pads. The structures are kept locked until a shop needs to transfer wastes to the site (see Figures 10, 11, and 12).

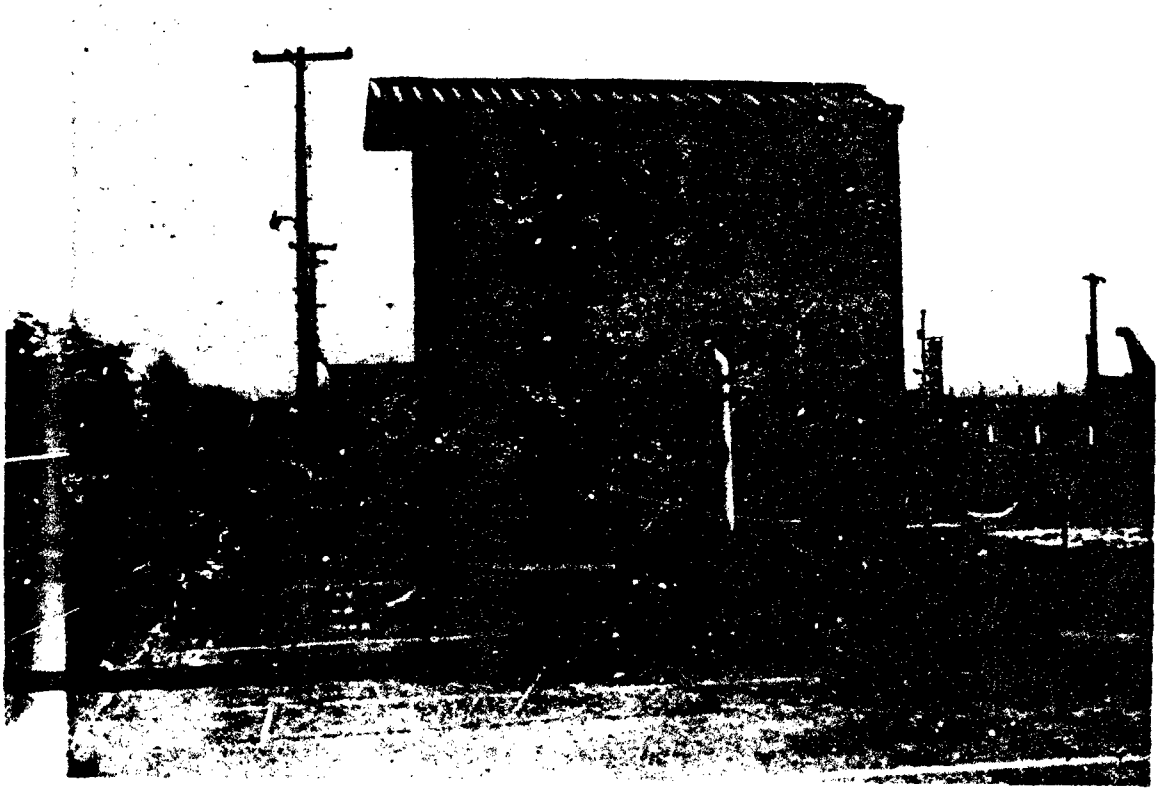

Figure 10: Mather AFB Accumulation Sites

Figure 11: Mather AFB Accumulation Sites

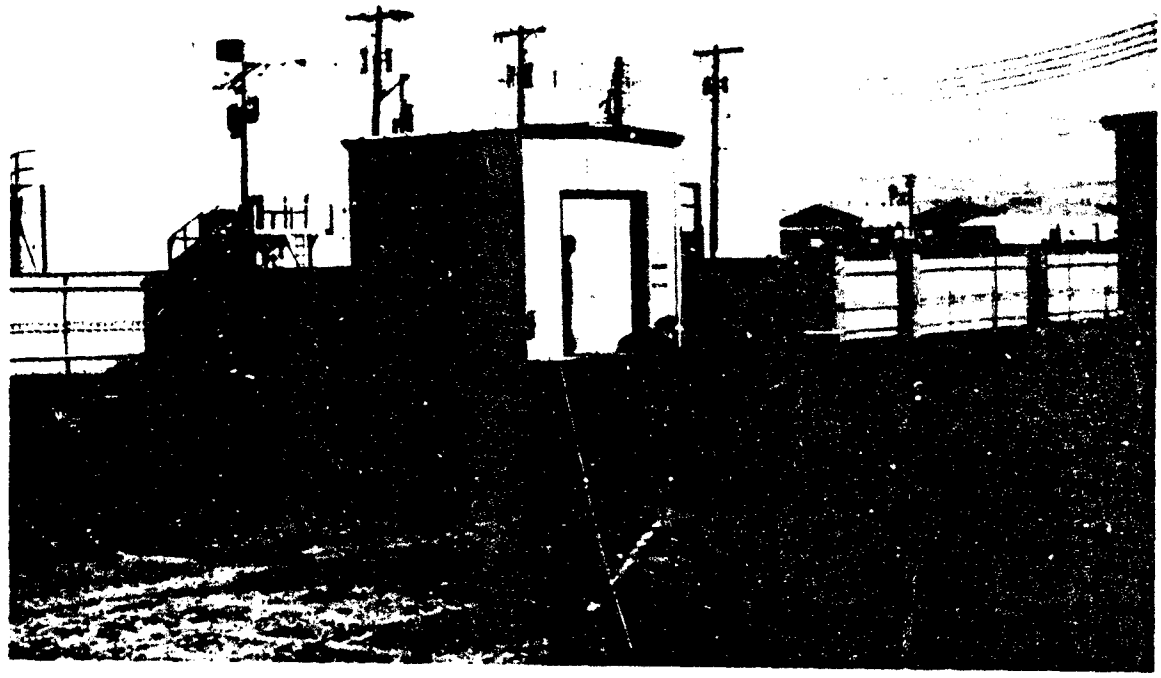

Figure 12: Mather AFB Accumulation Sites

6. Aboveground bulk storage tanks are used to store waste oils and fuels (see Figure 13). The arrangement increases the opportunity for recycling or selli:g the wastes.

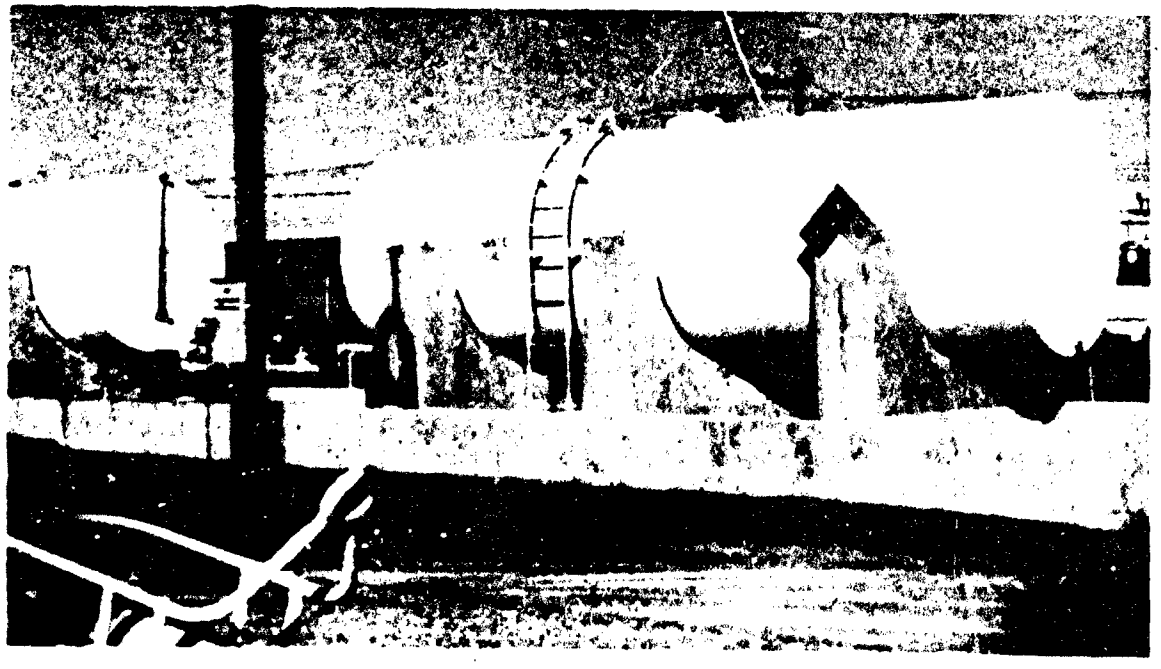

Figure 13: Aboveground Bulk Waste Storage Tank

7. 323 CAMS Corrosion Control shop has converted a waterfall paint booth to a dry filter paint booth. This changeover significantly decreased the man-hours and downtime associated with cleaning the paint booth. It also eliminated the discharge of wastewater to the sanitary sewer. Depending on analytical results it may eliminate or minimize hazardous waste disposal costs.

8. A solvent recovery system has been purchased by the base and is available for use. The recovery system will be used primarily for PD-680 recovery. The system should reduce the amount of waste disposed of as hazardous waste by approximately 20 percent. The base plans to hire someone to manage the HWSF and to operate the recovery system which is located at the HWSF.

9. A waste minimization study for Mather AFB was conducted by Idaho National Engineering Laboratory (INEL) in October 1988. At the time of the survey, the base was in the process of implementing many of the waste minimization suggestions provided by INEL.

VIII. RECOMMENDATIONS

A. Wastewater Characterization Survey

1. Two additional grab samples should be taken on separate days from the Hospital effluent. The samples should be analyzed using EPA Method 601 for methylene chloride and the results used to monitor the actual hospital effluent. Three analyses should give a better overall characterization of the waste.

2. Locate and prevent the mercury in the hospital from discharging into the sanitary sewer. According to Capt Klinenberg, a large quantity of mercury was disposed down the drain during the survey. Since only one representative sample was taken during the survey, at least two additional 24-hour composite samples should be collected. This should determine whether mercury is still being discharged on a routine basis. The dental evacuation system could be the source of mercury.

3. The soaps used for cleaning at the Fuels Lab, building 7060 should be diluted approximately 20:1. This would reduce the concentration of surfactants discharged into the sanitary sewer.

4. Investigate the source of chromium at the Photo Lab. Personnel should insure that all photographic chemicals are disposed of properly.

5. The West Ditch Outfall sampling results from two sections of the ditch showed contamination of VOCs and toxic metals. These chemicals are being discharged from the industrial shops. The oil/water separators from buildings 7035, 7024 and 7300 discharging into the storm sewerage system should be connected to the sanitary sewer.

6. Investigate the source of methylene chloride coming on base. At both influents, near building 4995 and near Mather Lake, methylene chloride was found.

7. Relatively high amounts of mercury were found in the Fuel Cell Repair discharge, building 7005. This may be due to a broken manometer. Investigate to find the source of mercury. At least two 24-hour composite samples should be taken and the analytical results compared to determine if mercury is being discharged on a routine basis.

B. Hazardous Waste Survey

1. The current practice of disposing ethylene glycol antifreeze as hazardous waste may be unnecessary since spent antifreeze is diluted and is readily biodegradable. The California Department of Health Services, Toxic Substances Control Division, recommends that the local sewer district be contacted to discuss the possibility of approving the disposal of waste antifreeze into the sewer system.

2. The used paint filters at 323 CAMS Corrosion Control should be analyzed to determine whether or not they are hazardous. If they prove to be nonhazardous, the filters can be disposed of as municipal waste.

3. Since many shop personnel are involved with handling hazardous wastes, the education and training program should provide opportunities for inputs from BES on the health hazards associated with handling hazardous wastes. Also, DRMO should provide input on the present and future costs of disposing hazardous wastes and the cost benefits of segregating wastes.

4. Spent Citrikleen should be analyzed to determine if it is hazardous. The sludge should be analyzed separately from the liquid since one may be hazardous and the other portion nonhazardous.

5. The wastewater from the waterfall paint booth at 320 FMS Corrosion Control and 323 Transportation Allied Trades should be analyzed at least three times for characteristic hazardous waste parameters. This should confirm the base's contention that it is not a hazardous waste. This should be done to provide documented rationale for discharging this waste to the sanitary sewer system.

6. Spent chemicals from the dye penetrant and magnetic particle inspection processes should be analyzed to determine the ones actually hazardous. Currently, all spent solutions are drummed and disposed of as hazardous waste. If any of the wastes are not hazardous, they can be disposed of down the drain to the sanitary sewer

7. The paper coveralls worn by 323 TRANS Allied Trades personnel during vehicle painting operations should be analyzed to determine if they are hazardous. Currently, the used coveralls are being disposed of as hazardous waste.

8. Satellite accumulation and accumulation site managers should also include the following site activity information in their log: (1) a unique sequence number to identify the wastestream generating the waste (each wastestream in a shop should have a unique number), (2) date, type, and amount of waste put in the drum (see Table 8 for example), and (3) start and stop dates of filling each drum. Also, a uniform system of documentaton should be used by all site managers on base.

TABLE 8: Example Hazardous Waste Disposal Log

PAINT SHOP HAZARDOUS WASTE DISPOSAL LOG FOR DRUM NUMBER: 1

Date	Time	Type of Waste	Amount of Waste
10 Jun 88	1000	Enamel Paint	1 qt
10 Jun 88	1300	MEK	1 gal
15 Jun 88	1500	MEK	1 gal
20 Jun 88	1100	Polyurethane Paint	1 qt
25 Jun 88	1300	Polyurethane Thinner	1 gal
30 Jun 88	0900	MEK	10 gal
5 Jul 88	1100	Enamel Paint	1 qt
6 Jul 88	1530	MEK	2 gal
6 Jul 88	1130	Enamel Paint	1 qt
7 Jul 88	1130	MEK	2 gal
8 Jul 88	1400	MEK	2 gal
9 Jul 88	1130	MEK	2 gal
11 Jul 88	1400	MEK	2 gal
13 Jul 88	1300	Enamel Paint	1 qt
13 Jul 88	1300	MEK	2 gal
14 Jul 88	1400	MEK	2 gal
16 Jul 88	1130	Enamel Paint	1 qt
16 Jul 88	1130	MEK	5 gal
18 Jul 88	1400	Polyurethane Paint	2 qts
18 Jul 88	1400	Polyurethane Thinner	3 gal
20 Jul 88	1500	MEK	4 gal
21 Jul 88	1600	MEK	1 gal
28 Jul 88	1630	Enamel Paint	1 gal
28 Jul 88	1630	MEK	5 gal
		TOTAL:	50 gal

Amounts:

MEK	43.00 gal	86.00%
Polyurethane Thinner	4.00 gal	8.00%
Enamel Paint	2.25 gal	4.50%
Polyurethane Paint	0.75 gal	1.50%

References

1. APHA, Standard Methods for the Examination of Water and Wastewater, 16th Ed., American Public Health Association, Washington DC, 1985.

2. California Regional Water Quality Board, Central Valley Region, Order No. 83-093, Wastewater Discharge Requirements for United States Air Force, Mather Air Force Base, Sacramento County, August 12, 1983.

3. Code of Federal Regulations Title 40, Part 261.2 - Characteristics of a Hazardous Waste, Office of the Federal Register, Washington DC (1987).

4. Code of Federal Regulations Title 40, Part 261.3 - Definition of a Hazardous Waste, Office of the Federal Register, Washinton DC (1987).

5. Code of Federal Regulations Title 40, Part 433 - Metal Finishing Point Source Category, Office of the Federal Register, Washington DC (1987).

6. Code of Federal Regulations Title 40, Part 403 - General Pretreatment Regulations for Existing and New Sources of Pollution, Office of the Federal Register, Washington DC (1987).

7. "Hazardous Waste Analysis Plan, Mather AFB, CA," 1988.

8. Conversation with Mike Mulderin, Engineer, Sacramento Wastewater Treatment Plant, April 13, 1989.

9. Letter: Sewer Use Permits, County of Sacramento, Department of Public Works, September 1, 1987.

10. Pretreatment of Industrial Wastes, Manual of Practice No. FD-3, Water Pollution Control Federation, 1981.

11. Sacramento County Regional Sanitation District Ordinance No. SRSD-0024, Sewer Use Regulations, March 22, 1988.

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Appendix A

Request Letter

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR TRAINING COMMAND (ATC)
RANDOLPH AIR FORCE BASE TX 78150-5001

REPLY TO ATTN OF: SGPB

4 JAN 1988

SUBJECT: On-Site Waste Stream Characterization/Hazardous Waste Studies at Air Training Command Bases

TO: USAFOEHL/CC

1. During the last six months three ATC bases in Texas received notices of non-compliance from the US Environmental Protection Agency. At our request the USAFOEHL Environmental Quality Branch (ECQ) performed waste stream characterization/hazardous waste studies at Reese and Sheppard AFBs to help in the responses to EPA. Laughlin AFB recently received a notice concerning operation of its waste water treatment plant (WWTP). The NPDES permit for the Laughlin WWTP expires 13 Jul 88. The EPA inspectors stated the application for renewal was due 13 Jan 88 and needed to be supported by data from a wastewater analysis. HQ ATC/SGPB perceives a need to have waste stream/hazardous waste studies performed at each of its bases to support various environmental requirements and requests USAFOEHL/ECQ to complete studies at the remaining ATC bases during the next twelve months.

2. Request waste stream characterization/hazardous waste studies be completed at ATC bases in the order listed in Attachment 1. The suggested completion dates are subject to your workload with the exception of Laughlin AFB. The data from the study for Laughlin AFB should be available by the end of the month shown to support the NPDES permit renewal application. The studies should collect sufficient data to characterize waste streams, including wastewater and WWTP influent and effluent; to determine compliance with EPA requirements; and to provide recommendations on waste handling, disposal, and minimization procedures. The attached listing does not include Reese, Sheppard, or Columbus AFBs since studies on these bases were previously requested.

3. The information listed below may already be available and you may wish to use it to avoid duplicating previous work.

a. Previous sampling conducted by Bioenvironmental Engineering Services (BES). Some bases have completed more sampling than others.

b. HQ ATC/DEEV contracted with the DoE HAZWRAP function to collect and analyze eight samples of process wastes from each ATC base. HAZWRAP will collect samples from Keesler, Lowry, and Randolph AFBs during FY88 and may collect samples from six additional bases in FY89 if funding is available. HQ ATC/DEEV will select the process sampling points. Please contact HQ ATC/DEEV, Mr. Carl Lahser or Capt David Parker, AV 487-3240, for more information and/or copies of the data.

c. Enid, Oklahoma, hired a contractor to study the waste streams at Vance AFB to determine pretreatment requirements for connection to the regional/municipal WWTP. This was mostly a paperwork review and sampling was probably not done. Vance AFB used the information to design an industrial waste treatment system. Please contact the Vance AFB Environmental Coordinator or HQ ATC/DEEV, Mr. Lahser, for the results of this study.

d. HQ ATC/DEEV contracted with the DoE Idaho National Engineering Laboratories (INEL) to write a waste minimization plan for Mather AFB. INEL collected information in Nov 87; they did not collect any samples. This information may be obtained through HQ ATC/DEEV, Mr. Lahser.

4. Please let us know if you can do this work and provide your schedule if the suggested completion dates are not reasonable. Contact the applicable BES offices (as shown in Atch 1) to arrange support and to request preliminary information. Please call Maj Crotchett or myself at 7-3764 if you have questions on this request.

Ronald L. Schiller

RONALD L. SCHILLER, Lt Col, USAF, BSC
Command Bioenvironmental Engineer
DCS/Medical Services & Training

1 Atch
ATC Base Priority List

cc: HQ ATC/DEEV
ATC MTFs/SGPB
HQ AFSC/SGPB

ATC PRIORITY LIST FOR
WASTE STREAM CHARACTERIZATION/HAZARDOUS WASTE STUDIES

Base	Suggested Completion Date	Base BES Point of Contact
Laughlin AFB	Mar 88	Lt O'Brien, AV 732-5259
Williams AFB	Apr 88	Lt Devenoge, AV 474-6516
Lackland AFB	May 88	Lt Vaughn, AV 473-3575
Randolph AFB	Jun 88	Capt Ballengee, AV 487-3256
Mather AFB	Jul 88	MSgt Sparks, AV 828-2284
Goodfellow AFB	Aug 88	TSgt Williams, AV 477-3123
Chanute AFB	Sep 88	Capt Davis, AV 862-4371
Lowry AFB	Oct 88	Lt Smith, AV 926-3176
Keesler AFB	Nov 88	Maj Jones, AV 868-6545
Vance AFB	Dec 88	TSgt Lamoreaux, AV 962-7241

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Appendix B

Analytical Results

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TABLE 1: PHYSICAL PARAMETER AND INORGANIC ANALYSES RESULTS

SITE / PARAMETER	Units	1	2	3	4	5	6	7	8	9	10
pH		7.5	6.7	8.3	7.9	7.0	7.5	8.2	8.0	8.4	8.3
COD	mg/l	<10	355	250	1000	500	170	725	220	325	950
BOD	"	---	---	---	---	656	---	---	---	---	---
TSS	"	128	654	576	94	980	4	108	39	38	810
O&G	"	---	40	8	0.6	8.8	5.3	<0.3	<0.3	11.5	64
Cyanide	"	---	---	---	---	0.005	<0.005	---	---	---	---
Boron	µg/l	<200	200	---	---	500	---	---	---	---	---
Arsenic	"	<100	<100	<100	<100	<100	---	<100	<100	<100	<100
Cadmium	"	<100	<100	<100	<100	<100	---	<100	<100	<100	<100
Chromium	"	<100	<100	<100	<100	<100	---	8806	<100	<100	<100
Copper	"	---	<100	<100	<100	<100	---	<100	248	569	<100
Lead	"	<300	92	259	25	< 20	---	< 20	< 20	<20	< 20
Mercury	"	< 10	< 1	12	< 1	10	---	< 1	< 1	< 1	< 1
Beryllium	"	---	<100	<100	<100	<100	---	<100	<100	<100	<100
Zinc	"	- -	2335	1024	274	162	---	103	112	<100	389
Aluminum	"	---	936	1209	138	471	---	1795	<100	<100	289

SITE		11	12	13	14	15	16 DAY 1	16 DAY 2	17	18	19 DAY 1	19 DAY 2
PARAMETER	Units											
pH		7.9	8.1		9.0	7.9	7.0	6.6	7.4	7.1	7.5	7.8
COD	mg/l	<10	225	265	620	240	285	< 10	425	50	15	20
BOD	"	---	---	---	---	---	---	---	181	225	---	---
TSS	"	3		80	2008	194	22	138	182	115	39	84
O&G	"	<0.3	1	<0.3	---	32.8	<0.3	<0.3	1.3	<0.3	<0.3	<0.3
Petro Hydro	"	---	---	---	---	27	---	---	---	---	---	---
Cyanide	"	---	---	0.02	---	---	<0.005	<0.005	0.005	<0.005	<0.005	0.11
Boron	µg/l	---	---	400	---	---	300	1000	500	500	1200	1300
Arsenic	"	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Cadmium	"	<100	<100	<100	<100	<100	<100	<100	399	<100	<100	<100
Chromium	"	<100	<100	<100	<100	<100	<100	<100	128	<100	<100	<100
Copper	"	<100	<100	<100	<100	<100	251	<100	<100	<100	<100	<100
Lead	"	< 20	< 20	< 20	< 20	< 20	< 20	24	140	< 20	< 20	< 20
Mercury	"	< 1	4.2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Beryllium	"	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Zinc	"	<100	<100	<100	266	166	296	126	795	<100	<100	<100
Aluminum	"	<100	<100	<100	108	144	153	523	818	<100	115	117

SITE PARAMETER	Units	20	21	22	23	24	25	26	27	28	29	30
pH		7.7	6.5	6.7	7.7	8.2	8.6	5.5	7.3	5.6	6.2	9.1
COD	mg/l	< 10	20	25	20	60	610	580	185	800	100	560
BOD	"	---	---	---	---	---	---	---	---	---	---	---
TSS	"	3	1	2	692	4	8	27	46	200	260	92
O&G	"	<0.3	0.4	<0.3	<0.3	8.1	7	----	3.4	---	---	52.8
Petro Hydro	"	---	< 1	< 1	< 1	6.4	6	----	---	---	---	48
Cyanide	"	<0.005	---	---	---	---	---	---	---	---	---	---
Boron	µg/l	<200	---	---	---	---	---	---	---	---	---	---
Arsenic	"	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Cadmium	"	<100	<100	<100	<100	<100	186	<100	<100	<100	<100	<100
Chromium	"	<100	<100	<100	<100	<100	586	<100	<100	<100	<100	<100
Copper	"	<100	<100	<100	<100	<100	432	<100	<100	210	<100	<100
Lead	"	< 20	< 20	< 20	< 20	< 20	103	184	30	466	24	270
Mercury	"	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Beryllium	"	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Zinc	"	<100	106	<100	<100	<100	558	1260	342	700	160	416
Aluminum	"	<100	297	<100	525	<100	142	246	109	676	<100	507

SITE PARAMETER	units	31	32	33	34	35	36	37
pH		6.8	8.5	8.9	6.3	7.1	7.3	7.7
COD	mg/l	15	2200	4100	4800	185	15	130
BOD	"	---	---	---	---	---	---	---
TSS	"	42	200	176	76	160	71	44
O&G	"	----	168	90.4	488	22.1	---	6.3
Petro Hydro	"	----	159	89	484	18	---	----
Cyanide	"	----	---	----	---	----	<0.005	---
Boron	µg/l	----	---	----	---	----	<200	---
Arsenic	"	<100	<100	<100	<100	<100	<100	<100
Cadmium	"	<100	217	3276	<100	<100	<100	<100
Chromium	"	<100	<100	913	<100	<100	<100	<100
Copper	"	<100	<100	104	<100	<100	<100	<100
Lead	"	48	40	1066	41	< 20	< 20	<100
Mercury	"	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Beryllium	"	<100	<100	<100	<100	<100	<100	<100
Zinc	"	264	274	2536	2040	<100	<100	<100
Aluminum	"	<100	409	934	<100	143	434	<100

TABLE 2: CHARACTERISTIC HAZARDOUS WASTE RESULTS

(EPA METHOD 625)

	EP Toxicity (mg/l)								Ig.	Cor.	Reac.	
Site	As	Ba	Cd	Cr	Pb	Hg	Se	Ag	DRGF	pH	Cn/S	Class
1	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	7.0	none	NH
3	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	8.0	none	NH
6	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	7.0	none	NH
9	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	9.0	none	NH
11	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	7.0	none	NH
15	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	7.0	none	NH
21	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	7.0	none	NH
22	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	7.0	none	NH
23	<0.1	<1.0	0.15	<0.1	<0.3	<0.01	<0.01	<0.1	no	7.0	none	NH
26	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	6.0	none	NH
29	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	6.0	none	NH
30	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	2.0	none	HAZ
31	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	7.0	none	NH
32	<0.1	<1.0	0.20	<0.1	0.33	<0.01	<0.01	<0.1	no	7.0	none	NH
33	<0.1	<1.0	3.50	0.99	1.82	<0.01	<0.01	<0.1	no	7.0	none	NH
34	<0.1	<1.0	<0.1	<0.1	<0.3	<0.01	<0.01	<0.1	no	7.0	none	NH
35	<0.1	<1.0	0.26	<0.1	<0.3	<0.01	<0.01	<0.1	no	7.0	none	NH

NH Represents "Not Hazardous"
HAZ Represents "Hazardous"
Ig. Represents Ignitability
Cor. Represents Corrosivity
Reac, Cn/s Represents Reactivity, Cyanide or Sulfide
Class Represents Classification (Hazardous, Nonhazardous)

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Appendix C

Waste Disposal Survey Form

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PLEASE HAVE THIS FORM READY FOR PICKUP BY:

SHOP: BLDG:

CONTACT: AUTOVON:

Please fill out this form as accurately and completely as possible. If you have any questions on filling it out, please call Lt Hedgecock at X5369.

Examples:

	Tank Capacity	Change Out Frequency	Method of Disposal
PD-680 used in tank	60 gal	4/year	55-gal drum

Comments: 1/2 gal of MEK per month is used as a wipe on/wipe off process for parts cleaning. None is disposed of.

OILS & FLUIDS

	Amt of Waste	Disposal Method
Brake Fluid	6 gal	placed in
Transmission Fluid	10 gal	same 600-gal
Hydraulic Fluid	3 gal	bowser
Motor Oil	50 gal	500-gal UGT
Synthetic Oil	8 gal	55-gal drum

QUESTIONS: If question does not apply to this shop put "N/A" beside it.

1. Does this shop have any underground storage tanks?_____

   If yes: How many?_____

   Capacity?_____

   What is stored in the tank?_____

_____

   How often is it cleaned out?_____

   Has it ever been leak-tested?_____

2. Do the floor drains of the shop lead to an oil/water separator?_____

   If yes: How often is it cleaned out?_____

3. Does the shop have any Safety Kleen units?_____

   If yes: How many?_____

   Tank capacity?_____

   How often are they serviced?_____

4. What does the shop do with dirty rags?_____

_____

5. What does the shop do with used "Speedy Dry"?_____

_____

6. Describe shop activities and responsibilities below:

PAINT WASTE AND THINNERS

PAINTS	Amount of Waste generated/month	Disposal Method
Latex		
Polyurathane		
Enamel		
Other		

Comments

THINNERS (list below)

Comments

STRIPPERS

Name of Stripper	National Stock #	Amount of Waste per Month	OR Tank Size	Change Out Freq

Comments

ACIDS

Name of Acid	Manufacturer	Amount of Waste generated/month	Method of Disposal

---

Comments

BATTERIES

Type of Battery	#/Month	Neutralized in Shop or Turned in Wet

Comments:

SOAPS/CLEANERS

Name of Soap	Dilution Ratio	National Stock#	Amt Used / month	Disposal Method

---

Comments

OILS AND FLUIDS

	Amt. of Waste Generated/month	Disposal Method
Brake Fluid		
Transmission Fluid		
Hydraulic Fluid		
Motor Oil		
Synthetic Oil		
Other		
Comments		

SOLVENTS/DEGREASANTS

Name of Chemical	Amt. of Waste generated/mo.	OR Tank Size	Change Out Freq	Disposal Method
Carbon Remover				
PD-680 used in tank				
Pd-680 used on washrack				
Other:				
Comments				

PHOTO CHEMICALS

Name of Chemical	Manufacturer	Amt/mo	OR Tank Size	Change Out freq	Disposal Method

Is the fixer processed through a silver recovery unit before disposal?_____

NDI Chemicals

Name of Chemical	Manufacturer	National Stock #	Tank Size	Change Out Freq	Disposal Method
Emulsifier					
Dye Penetrant					
Developer					
Comments					

FUELS

Name of Fuel	Amount/Month	Disposal Method

ANTIFREEZE

	Amount/Month	Disposal Method

OTHER CHEMICALS (Please list any chemicals that contain phenols)

Name of Chemical	Manufacturer	National Stock #	Tank Size	Change Out Freq	Disposal Method

Signature of person filling out this form_____

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Appendix D

Summary of Waste Disposal Practices for Each Waste Category

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SUMMARY OF WASTE DISPOSAL PRACTICES FOR EACH WASTE CATEGORY

Type of Waste: Oils & Fluids

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
TRANS Special Purpose Maint	Brake Fluid	12	REC
FMS Propulsion	7808 Oil	90	REC
OMS Non-Powered AGE	7808 Oil	300	REC
FMS AGE	Motor Oil	600	REC
FMS Pneudraulics	Hydraulic Fluid	150	REC
FMS AGE	7808 Oil	120	REC
CAMS AGE	Motor Oil	300	REC
Auto Hobby Shop	Brake Fluid	12	REC
OMS Non-Powered AGE	Oils & Fluids	300	REC
TRANS Fire Truck Maint	Oils & Fluids	120	REC
CAMS AGE	7808 Oil	12	REC
OMS Non-Powered AGE	Hydraulic Fluid	300	REC
FMS AGE	Trans Fluid	12	REC
CAMS Phase Docks	Hydraulic Fluid	480	REC
TRANS General Puprose Maint	Brake Fluid	12	REC
FMS AGE	Brake Fluid	1	REC
TRANS Special Purpose Maint	Trans Fluid	120	REC
FMS Propulsion	Calibrating Fluid	36	REC

CAMS Pneudraulics/Fuel Cell Repair	Hydraulic Fluid	480	REC
CAMS Phase Docks	Lube Oil	120	REC
FMS AGE	Hydraulic Fluid	120	REC
CAMS Propulsion	7808 Oil	220	REC
TRANS General Puprose Maint	Trans Fluid	120	REC
TRANS Special Purpose Maint	Hydraulic Fluid	12	REC
Auto Hobby Shop	Motor Oil	2640	REC
FMS Jet Engine Test Cell	Hydraulic Fluid	36	REC
FMS Propulsion	7808 Oil	350	REC
CAMS AGE	Hydraulic Fluid	24	REC
TRANS Special Purpose Maint	Motor Oil	960	REC
TRANS General Puprose Maint	Motor Oil	2040	REC
Auto Hobby Shop	Trans Fluid	240	REC
FMS Jet Engine Test Cell	7808 Oil	24	REC
	TOTAL:	10363	

Type of Waste: Paints & Thinners

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
FMS Corrosion Control	Paint Sludge	48	D
TRANS Allied Trades	Paints & Thinners	60	D
CAMS Corrosion Control	Paints & Thinners	190	D
	TOTAL:	298	

Type of Waste: Fuels

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
CAMS AGE	JP-4	24	REC
CAMS AGE	Diesel	130	REC
CAMS AGE	MoGas	120	REC
CES Liquid Fuels Maint	Fuel Sludge	800	D
FMS Jet Engine Test Cell	JP-4	120	REC
FMS AGE	JP-4 & MoGas	100	REC
CAMS Pneudraulics/Fuel Cell Repair	JP-4	NQ	REC
TRANS Refueling Maint	JP-4	45	REC
	TOTAL:	1339	

Type of Waste: Strippers

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
FMS AGE	Citrikleen	240	D
CAMS Corrosion Control	Isoprpyl Alcohol	NQ	UIP
CAMS Aero Repair/Tire	Citrikleen	30	D
FMS Propulsion	Carbon Remover	60	D
FMS Propulsion	Fingerprint Remover	12	D
CAMS AGE	Citrikleen	NQ	OWS
FMS Propulsion	Citrikleen	95	D
CAMS Corrosion Control	Denatured Alcohol	NQ	UIP

CAMS Corrosion Control	NAPTHA	NQ	UIP
TRANS General Puprose Maint	Caustic Soda	NQ	NA
		TOTAL: 437	

Type of Waste: PD-680

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
Propulsion	PD-680	15	D
CAMS Corrosion Control	PD-680	60	OWS
FMS Pneudraulics	PD-680	90	D
CAMS AGE	PD-680	90	D
FMS Repair & Reclamation	PD-680	175	D
CAMS Propulsion	PD-680	40	D
Auto Hobby Shop	PD-680	270	D
CAMS Pneudraulics/Fuel Cell Repair	PD-680	60	NA
		TOTAL: 800	

Type of Waste: Batteries

SHOP	WASTE	QTY/YR	DISPOSAL
TRANS Special Purpose Maint	Batteries	NQ	REC
TRANS General Puprose Maint	Batteries	NQ	REC

Type of Waste: Antifreeze

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
FMS AGE	Antifreeze	180	D
CAMS AGE	Antifreeze		D

		12	
TRANS General Puprose Maint	Antifreeze	360	D
TRANS Special Purpose Maint	Antifreeze	360	D
Auto Hobby Shop	Antifreeze	300	D
	TOTAL:	1212	

Type of Waste: Soaps

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
TRANS General Puprose Maint	Aircraft Soap	24	OWS
TRANS Special Purpose Maint	Aircraft Soap	12	OWS
323 CAMS Corrosion Control	CALLA 505 Soap	720	OWS
FMS AGE	Aircraft Soap	240	DD
FMS Corrosion Control	Alkaline soap	1440	OWS
	TOTAL:	2436	

Type of Waste: Photo and NDI

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
NDI	X-Ray Fixer	100	SRDD
NDI	Emulsifier	200	D
NDI	Penetrant	200	200
NDI	Mag Part Soln	100	D
FTW Photo Lab	Fixer	NQ	SRDD
NDI	Developer	400	D
NDI	X-Ray Dev	11	DD

FTW Photo Lab	Developer	0	DD

TOTAL: 1011

Type of Waste: Safety Kleen

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
TRANS Special Purpose Maint	Safety Kleen	180	SBC
TRANS General Puprose Maint	Safety Kleen	360	SBC

TOTAL: 540

Type of Waste: Rags

SHOP	WASTE	QTY/YR	DISPOSAL
Auto Hobby Shop	Rags	NQ	BL
TRANS General Puprose Maint	Rags	NQ	BL
FMS AGE	Rags	NQ	BL
CAMS Corrosion Control	Rags	NQ	BL
TRANS Special Purpose Maint	Rags	NQ	BL
CAMS AGE	Rags	NQ	BL
TRANS Refueling Maint	Rags	NQ	BL
CAMS Propulsion	Rags	NQ	BL

Type of Waste: Speedy Dry

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
TRANS Special Purpose Maint	Speedy Dry	NQ	D
FMS Phase Docks	Speedy Dry	1200	D
Auto Hobby Shop	Speedy Dry	NQ	D

TRANS General Puprose Maint	Speedy Dry	NQ	D
CAMS AGE	Speedy Dry	NQ	D

TOTAL: 1200

Type of Waste: Miscellaneous

SHOP	WASTE	QTY/YR	DISPOSAL
TRANS General Puprose Maint	Oil Filters	NQ	D
TRANS Special Purpose Maint	Oil Filters	NQ	D
Auto Hobby Shop	Oil Filters	NQ	D
TRANS Special Purpose Maint	Fuel Filters	NQ	D
TRANS Allied Trades	Aerosol Spray Cans	NQ	D
TRANS Allied Trades	Paper Coveralls	NQ	D

LEGEND:

D - DRUMMED
DD - DOWN DRAIN
BL - BASE LAUNDRY
NA - NOT APPLICABLE
REC - RECYCLED
NQ - NOT QUANTIFIED
SBC - SERVICED BY CONTRACTOR
UIP - USED IN PROCESS
OWS - OIL/WATER SEPARATOR
SRDD - SILVER RECOVERY THEN DOWN DRAIN

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...endix E

Summary of Wastes Disposed of as Hazardous Waste

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WASTES GENERATED AND DISPOSED OF AS HAZARDOUS WASTE AT MATHER AFB

Type of Waste: Paints and Thinners

SHOP	BLD #	PRODUCT	GAL/YR
CAMS Corrosion Contro	4150	Paints and Thinners	190
TRANS Allied Trades	7052	Paints and Thinners	60
FMS Corrosion Control	7035	Paint Sludge	48
		TOTAL:	298

Type of Waste: Fuels

SHOP	BLD #	PRODUCT	GAL/5 YRS
CES Liquid Fuels Maint	3386	Fuel Sludge	800
		TOTAL:	800

Type of Waste: Strippers

SHOP	BLD #	PRODUCT	GAL/YR
FMS AGE	7022	Citrikleen	240
FMS Propulsion	7024	Carbon Remover	60
FMS Propulsion	7024	Fingerprint Remover	12
FMS Propulsion	7024	Citrikleen	95
CAMS Aero Repair/Tire	4260	Citrikleen	30
		TOTAL:	437

Type of Waste: PD-680

SHOP	BLD #	PRODUCT	GAL/YR
CAMS AGE	4348	PD-680	90
CAMS Propulsion	4376	PD-680	40
FMS Propulsion	7024	PD-680	15
Auto Hobby Shop	3536	PD-680	270
FMS Repair & Reclamation	7045	PD-680	175
FMS Pneudraulics	7045	PD-680	90
		TOTAL:	680

Type of Waste: Antifreeze

SHOP	BLD #	PRODUCT	GAL/YR
FMS AGE	7022	Antifreeze	180
Auto Hobby Shop	3536	Antifreeze	300
TRANS General Puprose Maint	7052	Antifreeze	360
CAMS AGE	4348	Antifreeze	12
TRANS Special Purpose Maint	7052	Antifreeze	360
		TOTAL:	1212

Type of Waste: Photo & NDI

SHOP	BLD #	PRODUCT	GAL/YR
NDI	4260	Mag Part Soln	100
NDI	4260	Developer	400
NDI	4260	Emulsifier	200
NDI	4260	Penetrant	200
		TOTAL:	900

Type of Waste: Speedy Dry

SHOP	BLD #	PRODUCT	GAL/YR
TRANS General Puprose Maint	7052	Speedy Dry	NQ
Auto Hobby Shop	3536	Speedy Dry	NQ
TRANS Special Purpose Maint	7052	Speedy Dry	NQ
AGE	4348	Speedy Dry	NQ
FMS Phase Docks	7015	Speedy Dry	1200
		TOTAL:	1200

Type of Waste: Misc

SHOP	BLD #	PRODUCT	QTY/YR
TRANS General Puprose Maint	7052	Oil Filters	NQ
TRANS Special Purpose Maint	7052	Oil Filters	NQ
Auto Hobby Shop	3536	Oil Filters	NQ
TRANS Special Purpose Maint	7052	Fuel Filters	NQ

TRANS Allied Trades	7052	Aerosol Spray Cans	NQ
TRANS Allied Trades	7052	Paper Coveralls	NQ

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Appendix F

Master List of Shops

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MASTER LIST OF SHOPS

Shop	Contact	Building	Extension
323 TRANSPORTATION SQUADRON			
General Purpose Maintenance	Mr Koch	7052	3470
Special Purpose Maintenance	Mr Koch	7052	2709
Allied Trades	Mr Koch	7052	3470
Refueling Maintenance	Mr Koch	7051	4686
Fire Truck Maintenance	SSgt Justice	7075	2175
323 CONSOLIDATED AIRCRAFT MAINTENANCE (CAMS)			
Plating & Cleaning	Mr Dittrich	4150	2770
Corrosion Control	TSgt Hill	4150	3598
Pneudraulics/Fuel Cell Repair	TSgt Grant	4260	2765
NDI	Mr Davidson	4260	2247
Phase Dock	MSgt Aguon	4260	4966
AGE	Mr Jackson	4348	2792
Propulsion	TSgt Hofstadter	4376	2511
Aero Repair/Tire	Mr Harris	4260	2533
323 CIVIL ENGINEERING SQUADRON (CES)			
Liquid Fuels Maintenance	TSgt Track	3386	2229
Exterior Electric	Sgt Mercer	3354	3483
Entomology	Mr Burns	3474	3527
320 FIELD MAINTENANCE SQUADRON (FMS)			
AGE	Sgt Garzaro	7022	4829
Propulsion	SSgt McFarland	7024	2323
Corrosion Control	Sgt Orona	7035	2867
Phase Dock	TSgt Folkerts	7015	2242
Pneudraulics	TSgt Lueddecke	7045	4767
Repair and Reclamation	SSgt Thompson	7045	4952
Jet Engine Test Cell	TSgt Porter	7099	2674
Fuel Cell Repair	MSgt Head	7005	3512
320 ORGANIZATIONAL MAINTENANCE SQUADRON (OMS)			
Non-Powered AGE	Mr Tully	7033	4185
USAF HOSPITAL (HOSP)			
Medical Laboratory	MSgt Waller	650	4697
Pharmacy	Maj Merchant	650	3388

TRAINING SERVICES DIVISION (323 FTW)

Photo Laboratory	Mr Elder	2890	3515

323 AIR BASE GROUP (ABG)

Auto Hobby Shop	Mr Anderson	3320	3536

Appendix G

Summary of Waste Disposal Practices by Shop

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DISPOSAL PRACTICES BY SHOP FOR MATHER AFB

SHOP: CAMS Corrosion Control Building: 4150

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Isopropyl Alcohol	NQ	UIP
Rags	NQ	BL
CALLA 505 Soap	720	OWS
PD-680	60	OWS
Paints & Thinners	190	D
Denatured Alcohol	NQ	UIP
NAPTHA	NQ	UIP
TOTAL:	970	

SHOP: CAMS AGE Building: 4348

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Hydraulic Fluid	24	REC
Citrikleen	NQ	OWS
Diesel	130	REC
PD-680	90	D
7808 Oil	12	REC
Rags	NQ	BL
Motor Oil	300	REC
Speedy Dry	NQ	D
MoGas	120	REC
JP-4	24	REC
Antifreeze	12	D
TOTAL:	712	

SHOP: CAMS Aero Repair/Tire Building: 4260

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Citrikleen	30	D

TOTAL: 30

SHOP: TRANS Allied Trades Building: 7052

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Paints & Thinners	60	D
Spray Cans	NQ	D
Coveralls	NQ	D
TOTAL:	60	

SHOP: Auto Hobby Shop Building: 3536

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Speedy Dry	NQ	D
Brake Fluid	12	REC
Trans Fluid	240	REC
PD-680	270	D
Rags	NQ	BL
Motor Oil	2640	REC
Antifreeze	300	D
Oil Filters	NQ	D
TOTAL:	3462	

SHOP: FMS AGE Building: 7022

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Aircraft Soap	240	DD
Rags	NQ	BL
Antifreeze	180	D
Citrikleen	240	D
Trans Fluid	12	REC
Motor Oil	600	REC
JP-4 & MoGas	100	REC
Brake Fluid	1	REC
Hydraulic Fluid	120	REC

7808 Oil	120	REC
TOTAL:	1613	

SHOP: FMS Corrosion Control Building: 7035

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Alkaline Soap	1440	OWS
Paint Sludge	48	D
TOTAL:	1488	

SHOP: FMS Jet Engine Test Cell Building: 7099

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
JP-4	120	REC
7808 Oil	24	REC
Hydraulic Fluid	36	REC
TOTAL:	180	

SHOP: FMS Phase Docks Building: 7015

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Speedy Dry	1200	D
TOTAL:	1200	

SHOP: FMS Pneudraulics Building: 7045

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Hydraulic Fluid	150	REC
PD-680	90	D
TOTAL:	240	

SHOP: FMS Repair & Reclamation Building: 7045

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
PD-680	175	D
TOTAL:	175	

SHOP: TRANS Fire Truck Maint Building: 7075

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Oils & Fluids	120	REC
TOTAL:	120	

SHOP: TRANS General Puprose Maint Building: 7052

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Trans Fluid	120	REC
Motor Oil	2040	REC
Speady Dry	NQ	D
Batteries	NQ	REC
Antifreeze	360	D
Caustic Soda	NQ	NA
Oil Filters	NQ	D
Rags	NQ	BL
Safety Kleen	360	SBC
Aircraft Soap	24	OWS
Brake Fluid	12	REC
TOTAL:	2916	

SHOP: CES Liquid Fuels Maint Building: 3386

WASTE PRODUCT	QTY(GAL/5 YRS)	DISPOSAL
Fuel Sludge	800	D
TOTAL:	800	

SHOP: NDI Building: 4260

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
X-Ray Developer	11	DD
X-Ray Fixer	100	SRDD
Penetrant	200	D
Developer	400	D
Emulsifier	200	D

Magnetic Particle Solution	100	D
TOTAL:	1011	

SHOP: OMS Non-Powered AGE Building: 7033

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
7808 Oil	300	REC
Hydraulic Fluid	300	REC
Misc Oils & Fluids	300	REC
TOTAL:	900	

SHOP: CAMS Phase Docks Building: 4260

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Lube Oil	120	REC
Hydraulic Fluid	480	REC
TOTAL:	600	

SHOP: Photo Lab Building: 2890

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Developer	NQ	DD
Fixer	NQ	SRDD

SHOP: CAMS Pneudraulics/Fuel Cell Repair Building: 4260

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Hydraulic Fluid	480	REC
PD-680	60	D
JP-4	NQ	REC
TOTAL:	540	

SHOP: CAMS Propulsion Building: 4376

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
7808 Oil	220	REC
PD-680	40	D

Rags	NQ	BL
TOTAL:	260	

SHOP: FMS Propulsion Building: 7024

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Calibrating Fluid	36	REC
7808 Oil	350	REC
Carbon Remover	60	D
Fingerprint Remover	12	D
PD-680	15	D
Citrikleen	95	D
7808 Oil	90	REC
TOTAL:	658	

SHOP: TRANS Refueling Maint Building: 7051

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Rags	NQ	BL
JP-4	45	REC
TOTAL:	45	

SHOP: TRANS Special Purpose Maint Building: 7052

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Batteries	NQ	REC
Antifreeze	360	D
Fuel Filters	NQ	D
Aircraft Soap	12	OWS
Motor Oil	960	REC
Rags	NQ	BL
Hydraulic Fluid	12	REC
Safety Kleen	180	SBC
Oil Filters	NQ	D
Trans Fluid	120	REC

Speedy Dry	NQ	D
Brake Fluid	12	REC
TOTAL:	1656	

D - DRUMMED
DD - DOWN DRAIN
BL - BASE LAUNDRY
NA - NOT APPLICABLE
NQ - NOT QUANTIFIED
UIP - USED IN PROCESS

REC - RECYCLED
OWS - OIL/WATER SEPARATOR
SBC - SERVICED BY CONTRACTOR
SRDD - SILVER RECOVERY THEN DOWN DRAIN

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